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# COMPUTERVIEW

Christmas is a family time, a time for reflection, and for quiet. But in the computerworld, there is little time for a pause as the rapid rate of technological advance quickens further each year.

OVER the next two years, IBM watchers expect the whole of System 370, including the 3030 series, to be replaced by DP Division, while General Systems Division extends the System 30 line to supplant System 3.

The first announcements are expected in January, with the launch of the E-series to replace the bottom end of System 370, up to the level of the 135.

Intensely the 370/115 and 125 are multiple processor complexes, although this is largely hidden from the user. The E-series is expected to be more overtly modular, with a range of functional processor options for handling specific tasks such as communications, peripherals control and databases.

The announcement is likely to include at the minimum a revamping of the OS/VS1 operating system to accommodate the major changes in workload mixes which have taken place since 1970. It could well, in addition, come up with a new operating system, together with the ability to run VSI and earlier systems in emulation mode.

Whatever the software, it will emancipate the low-end 370 batch user and move him into the bright new world of transaction processing, offering him a range of distributed options. It might also incorporate some kind of advance in secondary or intermediate storage, possibly bubble memory or charge-coupled devices.

Some significant enhancement in database capability is also likely, and there will no doubt be totally unexpected features in the new series.

This week Computer Weekly looks at some of the most significant events of the past year in which IBM, with its 3030 series price cuts in particular, once more sets the trend. During the year, Computerview

comments on the news and the trends as they develop. We end the year by looking ahead at some of the goodies that IBM may be unwrapping, some time in the next few years.

## The surprises IBM has in store for 1978

At the top end of System 370, a replacement for the line from the 148 through to the 3033 is coming. Dubbed by some the H-series, it is expected to be announced substantially by mid-1979 and must above all run MVS efficiently.

It is possible that the E-series operating system might be a subset of MVS, but much more likely that there will simply be a power overlap between the E-series and the H-series, with considerable commonality between the E and H operating systems at the JCL level.

Although it will almost certainly have considerable distribution of functions between several processors, the H-series is likely nevertheless to be a central site system, designed to support a wide range of distributed systems presumably using SNA.

A key feature of H-series will be the System R relational database, which is likely to be presented as a compelling alternative to IMS, though whether users will rush to convert to it is open to question. It is not yet clear whether System R will include major elements of hardware or consist entirely of software.

It is expected to be announced within two years, and a version is said to be running already at Boeing in the US. In whatever shape it finally appears, it will have to mesh with MVS, be-

cause otherwise, to quote Gene Amdahl, IBM will have made an enormous investment in MVS for nothing.

A bewildering array of options will be presented to 370 users, because in February IBM is due to announce DP Division's mini-computer, Orbit.

Likely to offer more power than does GSD's Series 1 mini at present, Orbit is also likely to be offered with more system software. Users should find it an enticing alternative to many of the conservative network products that currently make up IBM's catalogue, with devices like the 3780 transaction systems and the 3705 communications controller.

On all the new products, there is likely to be a strong price-performance improvement over the products that they replace, with labour-intensive items like software and maintenance representing an increasingly large proportion of the cost.

There is some confusion in the minds of many about the relationship between IBM's DP and GS divisions, but in marketing terms they are best regarded as two independent companies. What GSD does with System 3 and the System 30 line bears very little relation to what DP does at the bottom end of 370, and some users may well be wooed by salesmen from both divisions.

## INTERRUPT...

### Ode to an acoustic coupler

FOR Christmas, John H. Davidson of Graphic Display Systems, Cambridge, a frequent contributor to Interrupt, has burst into verse. He wins the £5 interrupt prize plus a £3 poetic bonus. More poems in Downside Special on page 14.

When I from the joy of 'oustic coupled interface am turned,  
 By hard or software faults of gravity unknown,  
 And when from flickering graphics screen am spurned,  
 To wait while experts far away do groan,  
 Then to a task of unremitting pleasure I repair:  
 The handset from its cosy nest displaced.

I whistle to the coupler some sweet happy air.  
 In hope to make thus, artistry, no display's face:  
 At first a line, a curve, a dainty wisp of swirl,  
 A character or two give abstract form.  
 And then perchance a wisp or mountain's drawn,  
 And by degrees a thing of beauty's born.  
 But heed, dear Friends, the one who whistles first his name along the line,  
 Shall then be deemed computer, not a mind.

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Ten  
 years  
 ago...

COMPUTER WEEKLY  
 DECEMBER 14  
 AND 21/28, 1967

THE government's Buy British policy aroused fear that the development of the UK computer industry would be stifled in the long term. The UK could not match machines such as the CDC 6600 and proposed 7600, and the Burroughs B8600... Philips entered the general-purpose computer market with the announcement of the P1000 family... The management structure of the BCS was reorganised and a management board, representing branches, membership, education and technical interests, was formed... Polish production of computers was entering a new stage, with serial production of over 1100s and 1200s.

## Fowl system copes with Christmas rush

REAOERS buying a Chunky Chicken for Christmas will be fascinated to learn that O. B. Marshall (Newbridge), the firm that processes nearly 30 million of them every year, is now using a Socheck key-to-disc system from Redifon Computers for its data input.

The Socheck system complements O. B. Marshall's existing Burroughs 81700 computer and is being used for jobs like ledger updating, payroll, form management statistics and order entry.

Future plans include a fowl inquiry — sorry, a file inquiry — system with Socheck terminals in user departments.

Organisations outside the currently booming poultry industry that have placed orders with Redifon of late include the Nottingham Building Society and London-based magazine distributors Argus Distribution Ltd. Both are installing Redifon Redcheck systems.

## NCR snubs union on sales policy

By Robin Webster

A CALL by ASTMS for a say in NCR's sales policy, included in part of its annual wage claim (CW, December 1), has brought a quick response from the company.

Normally, says NCR, it would not publicly comment on its discussions with unions but this particular point needed clarification.

"NCR has an agreement with ASTMS restricted to field engineers which incorporates

standard consultation procedures," said Don Fraser, director of personnel resources at NCR. "There is no way that marketing policy will be accepted by the company as negotiable, either with ASTMS or any other outside body."

"The determination of sales policy is the responsibility of senior management," he continued. "It is totally unrealistic to suggest that it can be delegated to periodic review at the bargaining table and dealt with as an addendum to an annual wage claim for field engineers."

ASTMS says that the need to have some say in the policy stems from concern over the long-term interests of its members. Also, there was some doubt as to whether the company was going to retain an element of mechanical business for the future.

This point was taken up by Rex Fleet, NCR's managing director. "After a difficult period of transition, NCR has now consolidated its position as a major supplier of computers and terminals," he said. "Our sales policy, our R&D investment and our future lies in achieving further growth and success in the dynamic environment of EDP. There is no going back. There is no question of our dissipating our resources

## AT&T's Bell data net expected early in 1978

US OBSERVERS now believe that AT&T will begin introducing the so-called Bell Data Network early in 1978, although probably under another name. Service is likely to be introduced in one or two states initially, but it is intended to grow nationwide.

The network is a major plank in AT&T's challenge to IBM, and has been designed to provide an attractive alternative to IBM's Systems Network Architecture concept (CW, November 10). It will allow point-to-point communications between any commonly used brand of terminal via a communications processor

at the user site. It appears that, as with Transpac in France, the charges will be distance-independent and based solely on the volume of message traffic sent.

It will use both store-and-forward and straight packet-switching techniques depending on the urgency of the message and therefore the priority assigned to it by the user. The delay will vary from 200 milliseconds to four hours.

Key feature of the network will be the additional availability of software packages for things like data entry, inquiries, RJE and message distribution.

## Micro show success

MORE than 30 companies have reserved stands at Microsystems 78, and the exhibition side of the event already shows promise of being a runaway success.

The organisations which see Microsystems as a useful means of bringing their products and services to a wide spectrum of engineers, systems designers and personal computing enthusiasts, range from giant international corporations down to the relatively small systems design companies which are playing an important part in the microprocessor boom.

Among the "giants" are Texas Instruments, Intel, Digital Equipment Co. and Plessey Microsystems. But at the other end of the scale are smaller companies such as Compelec

Co-Mari, and Lynx Electronics which are making their name in the personal computing field.

The important areas of software and systems design for microsystems is represented by CAP, Microsoft, Warren Point and Microware, among others. Microsystems 78 exhibition will provide something of interest to most microprocessor users from OEM purchasers to personal computing enthusiasts.

Those who want to know more about the Microsystems 78 seminar should contact Chris Higwell, Room 125, Dorset House, Stamford Street, London SE1. Telephone 01-261 8738. To book stand space at the exhibition, contact Lloyd Collins at the same address. Telephone 01-261 8757 or 261 8743.

## Philips into UK banking

A SIGNIFICANT breakthrough into the London banking market has been made by Philips with a contract for a two-processor PDS 8000 banking terminal system from Citibank's London branch.

Citibank has installed the system at its Strand offices, and intends to use one processor for order processing and stock control of the \$800 million of travellers' cheques it issues annually. The other will be used as a six-position teller terminal system for all branch transactions.

The teller system, which includes printer, keyboard and plasma display at each position, will transmit batch data daily to the bank's IBM 370/135 mainframe. The travellers' cheque system, consisting of two VDUs and a line printer, will also serve as an emergency back-up system.

Citibank has installed an enormous number and variety of minicomputers at various sites throughout the world.



The 1977 Bowling World Cup, held last week at the Charrington Bowl, Tolworth, in south west London, attracted 78 competitors from 40 countries and the computerised scoring system was provided by Atkins Computing.

It was the first time the event had been held in the UK for 11 years.

As the final score was input online to one of Atkins' Sigma 8 computers at nearby Epsom, using the terminal seen here behind the bowling lanes. Printouts listing

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## MICHIE'S CHRISTMAS VIEW

### Closely observed trains...

READERS were strangely stimulated by "Trains going east and trains going west" (CW, November 10) and an avalanche of rules poured in for discriminating the two kinds of trains.

The following were the three simplest rules found by Larson and Michalski's inductive learning program:

(i) If there is a triangle containing car then immediately followed by a polygon containing car then Eastbound else Westbound (polygons of course include triangles);

(ii) If there is a short closed car then Eastbound else Westbound; and

(iii) If there are two cars, or if there is a jagged-top one then Westbound else Eastbound.

Out of a total of 72 readers' entries, no fewer than 44 hit on rule (ii), and six others offered a version of this same rule based on counting axles or wheels rather than trucks.

A fourth entry could be scored as (i) except that the various kinds of short closed cars were separately listed instead of being given as a single description. No entries clicked with (i), but some were at least as close, such as:

If there are more than two kinds of freight, then Eastbound else Westbound

produced by two readers. How do we compare the efficiency of this Pascal program running on the CDC Cyber 175 with the ponderings of Computer Weekly readers? Computation time was around 10 seconds. The Cyber can be credited with approximately 10 million instructions per second, making a total outlay of 100 million instructions-executions.

According to J. M. Stroud, cited by Halstead, the number of binary discriminations per second which the human brain can manage at a print is about 20.

Although Edgar Dijkstra was once clocked at 50 per second for a three-minute burst, for mortals a more relaxed average of 10 per second can probably be assumed. So how to relate the execution of one Cyber 175 instruction to the making of one binary comparison?

At this point I close my eyes and declare that one instruction-execution is worth more than 10 and less than 100 binary discriminations (BDs). If this be so, then the Sargon-Nichalski program required a total of between 10<sup>6</sup> and 10<sup>7</sup> BDs, the equivalent of thinking.

continuously for between 10<sup>6</sup> and 10<sup>7</sup> seconds — i.e. between three and 30 years of continuous mental effort.

So readers who polished off the problem in seconds or minutes are well ahead of the program in their algorithms (whatever they may be) for inductive logic, although probably not in their ability to represent the processes explicitly.

Children have more difficulty in inventing rules. Even at age 10 the transition from judging everything by its concrete circumstances to an ability to cope with abstracts and hypotheticals has only just begun. Readers might like to try their children on their ability to understand the train problem.

An interesting feature of the first two rules is that a program knowing nothing about counting could still have got them. At the other extreme one reader who was bitten by the counting bug found that the number of sides in the cargo (circle counts), triangle 3, etc. is a factor of 60 if and only if the train is going West!

We sometimes forget what an elaborate trick counting is. "At first thought," writes L. L. Conant, "it seems quite inconceivable that any human being should be destitute of the power of counting beyond 2. But such is the case; and in a few instances languages have been found to be absolutely destitute of pure numeral words."

On the other hand the crow has been said on good evidence to count up to four. Lichtenberg's belief about his night-Ingale seems less well founded. He gave the bird three mealworms every day, one at a time, and remarked that after the third it knew the feast was over.

The owner of Clever Hans, the counting horse, had a similar faith, but the horse's art consisted in reading his master's involuntary signs when the pre-set number was reached.

For myself, I find that the Australian aborigine system of "One, Two, Many" works pretty well for most purposes, although when applied to the number of shopping days to Christmas it tends to cut things a little too fine. On that thought let me wish all readers the merriest of Christmases, and a Happy New Year.

References: M. H. Halstead (1975) 'Toward a theoretical basis for estimating programming effort', Technical Report CSD-75-143, Purdue University, USA; J. Larson & R. S. Michalski (1977) 'Inductive inference of VL decision rules', ACM SIGART Newsletter, No. 85, 35-44.

## FUTUREVIEW

MAN first used his fingers for counting when he needed to keep a record of something, for example sheep. As his herd grew his counting method became quicker and could handle higher numbers with two main aims: first, efficiency; second, more time for leisure.

As time has gone by, things around Man have grown more sophisticated with those two aims in mind. First the abacus, then came the mechanical aids such as Babbage's calculating device.

Then came a great advancement in calculating machines, a machine capable of doing calculations in a fraction of a second, the computer.

From first generation valves to third generation integrated circuits the computer was developed with the same two aims in mind, and now the computer can do calculations in microseconds.

But what about the future? I think four main things will change in the future due to the computer: safety, travel, public services and dangerous jobs.

Although having computers checking computers is not economical, I think that in some cases it is essential for reasons of safety. Although some manufacturers claim that their computers are infallible they sometimes do go wrong. In the case of a Jumbo Jet for example, with pilots in the jet and personnel in ground control the passengers are quite safe.

With pilots and onboard computer in the jet and personnel in ground control the passengers are safer still. But with pilot and onboard computer in the jet and computer with one or two men checking in ground control, a crash would be exceedingly rare. I think planes carrying 400 or more passengers should adopt this latter system in the future.

Additionally, as far as railway tracks are concerned, sections near platforms and bridges should be rigged so that when a person falls on to the rails a message reaches the train on the particular route.

This could be done by a computer. When a person falls on to the rails a monitor detects the fact this has happened and since it is connected to the computer, a message can reach the train in microseconds enabling the emergency brake to be pulled.

When we discover how to split up matter and reassemble it anywhere in the universe, computers full of IF and GOTO statements will take complete charge of the whole operation.

In fact the most luxurious and leisurely way in the safest way, leave the work for computer controlled robots (CCRs) and computers. All we would have to do would be to program them ideas to be executed by robot, construction workers. Also to check via scanners, closed circuit television — computers aren't infallible.

In the not too distant future we will still use the old 1977 rules. There would be one main control point from which a computer would separate. All the trains would have TV cameras located at various spots on the chassis which would be connected to the computer.

Further on in the future, however, due to their speed and position high above the land, with virtually the same system as the "old" trains.

Space travel would use computers to their greatest advantage. This is mainly due to the fact that space flights will take so long that we will need to put our astronauts in suspended animation. While they are in sus-

## Schoolboy's ideas of a world run by robots...

not be damaged by the "natives". If intelligent life did evolve the force would act as an intelligence test. When they (the aliens) broke through the force field the computer would send one last message back to Earth that intelligent life had evolved.

CCRs will dominate the emergency services in the future mostly because both fire and police services involve a degree of danger. Imagine a fire in a house. The firemen pour on foam and man ladders. They climb the ladders and smash the windows with hatchets. They climb through, pick up the victim and climb down the ladders holding the victim in a fireman's lift.

During that episode the fireman might be overcome by fumes or the fire might cause a plank of wood to fall on him; he might even have to climb into an asbestos suit before he rescues the victim.

A CCR would walk up the wall, smash the window with its

A community of robots, computers and humans involved together in a reliable, workable and economical system. That is the Futureview of 14-year-old David Browett, of Coventry, who won the Young Computer Scientist of the Year award, organised by the Coventry branch of the BCS.

David believes that a machine take-over of the world is inevitable. He shares this belief with two other Futureview contributors, Arthur Clarke (CW, November 10) and Isaac Asimov (CW, October 13), in this extract from his winning essay.



As computers get more advanced they will dominate the control systems of space ships. As in "2001: A Space Odyssey" (by Arthur C. Clarke) the computer will run the whole ship. But there is a lesson: never build a perfect computer.

A perfect computer will be a computer of our own image. This means it will be prone to experiencing something like human emotions: it might get angry or bored or eventually go completely mad.

As man discovers the universe he will discover more and more planets. Some of these are bound to be able to sustain life and these life forms might develop into civilisations. Man being alone in his search, will be definitely interested in promoting life forms but he cannot leave men on every planet that he visits.

So how can their life forms be monitored?

The answer is a mini rocket housing a computer. Such computers will monitor and relay data back to Earth and, in addition, will take off and head for their next destination if required.

If possible, these monitors would be protected by some kind of force field so they would

first, pick up the victim in a firm grip, and climb back down, not bothering about the fumes or anything of the sort.

As far as the police are concerned, let us imagine a crook riding a bank and then a policeman coming in and spotting him; the crook would fight him or run, standing a reasonable chance of escape. A CCR, however, would spot the crook and grip him, then take him to the police station to lock him up. As simple as that.

The CCR might fire ropes to render the criminal helpless or, in the case of organised crime, it would be armed.

There would be three types of CCRs used by the police. First a tracked body-type structure with radar and firing ropes. Second, a senior humanoid CCR which would deal with inquiries and the more sophisticated crooks. Thirdly an armed CCR in humanoid or tracked form.

Using computers in the security forces would be to use a kind of Orwellian "Big Brother". In whose world there is no privacy, I wouldn't care. It is far: I would monitor all security establishments and military bases.

If these monitors linked to the computer picked up something

'When we discover how to split up matter and reassemble it anywhere in the universe, computers full of IF and GOTO statements will take complete charge of the whole operation.'

## NEWS IN BRIEF

### \$104m French exports to US

BENEFITS to France of having CII-Honeywell Bull manufacturing mainframes, mainly Level 64, for export to the US, are underlined by US Department of Commerce Import-export figures. The Department estimates that in 1977 France exported \$104 million of computer equipment to the US, whereas the UK exported only \$32 million. Even Italy, with Honeywell building Level 62 there, did better than the UK, managing \$44 million of exports.

In the reverse direction, the UK imported an estimated \$396 million of equipment, France \$300 million and Italy only \$98 million.

### ITT 'replaces' IBM

MAIN UK offices of the Royal Insurance Group are to be equipped with ITT 3280 VDU-based systems worth over £600,000. They replace IBM 3270s and are part of a plan to link all the Royal's offices to its two IBM 370/158s at head office in Liverpool.

### Panther picks ABS

AN Allied Business Systems Multibus computer has been installed by Panther Westwinds, the prestige car maker. The £40,000 system features 48K of memory.

### Gas Corp order

THE British Gas Corporation has ordered £100,000 worth of equipment from Taylor Instrument, of Stevenage, to be installed at the liquidation and storage plant to be built on the Isle of Grain. The Taylor Quick-Scan 1300T and 1300R electronic transmitters and controllers will measure and control temperature, pressure and flow throughout the plant.

### ADDS' profits up

REPORTING profits up 17% at \$3.84 million on turnover up 37% at \$22.8 million for the first nine months of 1977, Applied Digital Data Systems of Hauppauge, New York, noted that during the July to September quarter, deliveries to NCR represented 41% of all business done.

### Takeover

THE bid by Microdata for CMC Ltd has been accepted, and the US company has acquired 75% of the operation for \$4m. Ray Parry, chairman and managing director, remains as chairman of CMC Europe; Irvine Eida becomes CMC managing director; and Don Fuller, president of Microdata, and Gary Liebel join the CMC board.

### PO merger

MERGER of the Post Office Data Processing Service with the telecommunications branch, recommended in the Carter Committee report on the future of the Post Office, is to be implemented next April.

### High-speed bus

A HIGH-SPEED inter-computer bus is the key to a multiple-processor functionally distributed system concept announced by Datapoint in the US. It will be launched in Europe at the Datapoint users conference in Birmingham next April. The bus can be up to 2,000 feet long and carries data at 2.5 Megabits per second.

The fact is, we don't have the materials on our planet to keep going. In industry, science — just a few which come to mind. So to keep our civilisation as it is we must mine other planets. And CCRs are perfect for the job, allowing humans to live in comfort.

Those jobs such as a heavy worker checking bottles, seem quite easily done by a computer.

When I have described an entire community of CCRs, computers and humans involved together in a reliable, workable and economical system, one which I think would



The operator of this IBM 3250 graphics display system is using the light pen and program function keyboard (left) to manipulate data on the screen of the 3251 display station. He uses the alphanumeric keyboard (right) to annotate the picture and to input data to the system.

## Improved IBM graphics

AN image with considerably less flicker is one of the main improvements over the IBM 2250 interactive graphics display system offered by its successor, the 3250.

The 3250 was developed for IBM by Sanders Associates under an agreement made early this year to settle Sanders' anti-trust suit against IBM (CW, February 3), and is being manufactured by Sanders at Nashua, New Hampshire. This is under the direction of IBM's plant at Raleigh, North Carolina, and the IBM laboratories at Hursley in the UK.

Some of the other display improvements over the 2250 provided by the 3250 include four different character sizes, compared with two on the 2250, the use of eight strokes to form each character, instead of four, and four different line types — solid, dashed, dotted and dot-dashed.

Another important difference is the use of two levels of control instead of one. The 3250 control unit connects directly to the interface channel of the host mainframe and can drive up to four 3255 display controllers located up to 5,000 feet away.

Each 3255 has 32K refresh memory and handles

vector and character generation for one or two 3251 display stations.

The 3251 comes with a 21-inch display, an alphanumeric keyboard, a hand held light pen and a program function keyboard. The latter has back lighted keys which enable the host mainframe to guide the operator.

Despite the more complex control provided by the 3250 and the other improvements over the 2250, it costs less than the existing system even with only one display station. IBM quotes £130,575 for a 3250 system with four displays, two display controllers and one 3251.

IBM points out that the 3250 is generally compatible with existing 2250 applications programs and is supported by its Graphics Programming Services package, and its Graphics Sub-routine Package, both of which run in a VS environment.

● A tough competitor for the 3250 could arrive on the scene next year in the form of the interactive graphics display system that Calcomp is developing around the Solor minicomputer, 9EMS.

## Micro could be the 'black death' of UK industry

Martin Banks reports on the Impact of Electronics Conference

INDUSTRY must rapidly come to terms with the capabilities of electronics or risk the real possibility of "going under". This was one of the themes to emerge from the Impact of Electronics Conference, organised by Electronics Weekly and held at the London Hilton last week.

The 150 delegates were told that the microprocessor, for example, could easily become UK industry's "black death" if its current inflexible and complacent attitudes were not changed.

Alex d'Agapayeff of CAP pulled few punches in an emotional presentation. "Europe is so inflexible and complacent," he said. "There is an almost Canute-like belief in static markets that technological developments cannot change. We think that exports don't matter and Japanese imports don't count. In fact many people now buy Japanese to get quality products."

And the automated office? d'Agapayeff attacked the attitude held by many that says "I have an automatic right to my own security." The UK, he said, had an idea fix that the automated office was pure Hollywood fiction and not a practical reality, a point made earlier in the day by David Kohler, of IBM.

d'Agapayeff suggested that 1979 could be disaster year for UK industry, and gave one or two pointers. US car manufacturers, for example, were heavily committed to using microprocessors in their 1979 models, yet America had a falling birth rate. These cars (almost certainly better than UK models)

## Two die in plane crash

AMONG those killed in the crash of the hijacked airliner in Malaysia on December 4 were Harold Godfrey, London region manager of Dataskill, and Donald Matthews, a partner in the management consultancy Paat Maryick Mitchell. Both were visiting the Far East for their companies.

Godfrey joined Dataskill in

1971, and had been responsible for the development of the company's operations in the banking and financial fields. He leaves a widow and three children.

Matthews joined Paat Maryick Mitchell in 1958 and became an executive partner in 1968. He leaves a widow and daughter.

### ITT mini controls power

BULK distribution of electricity in the Central Electricity Generating Board's North West Region is being controlled by an ITT computer system based on the hardware of the 8400 ADX message switching system and programmed mainly in Coral.

Data related to the state of switches and power flows is processed by the mini, a dual General Automation SP-18 system called by ITT the 1690, and displayed on 20 VDUs and on mimic wall diagrams. Worth £1 million, the system replaces electro-mechanical equipment and is the first of a new standardised design adopted by the CEBG.

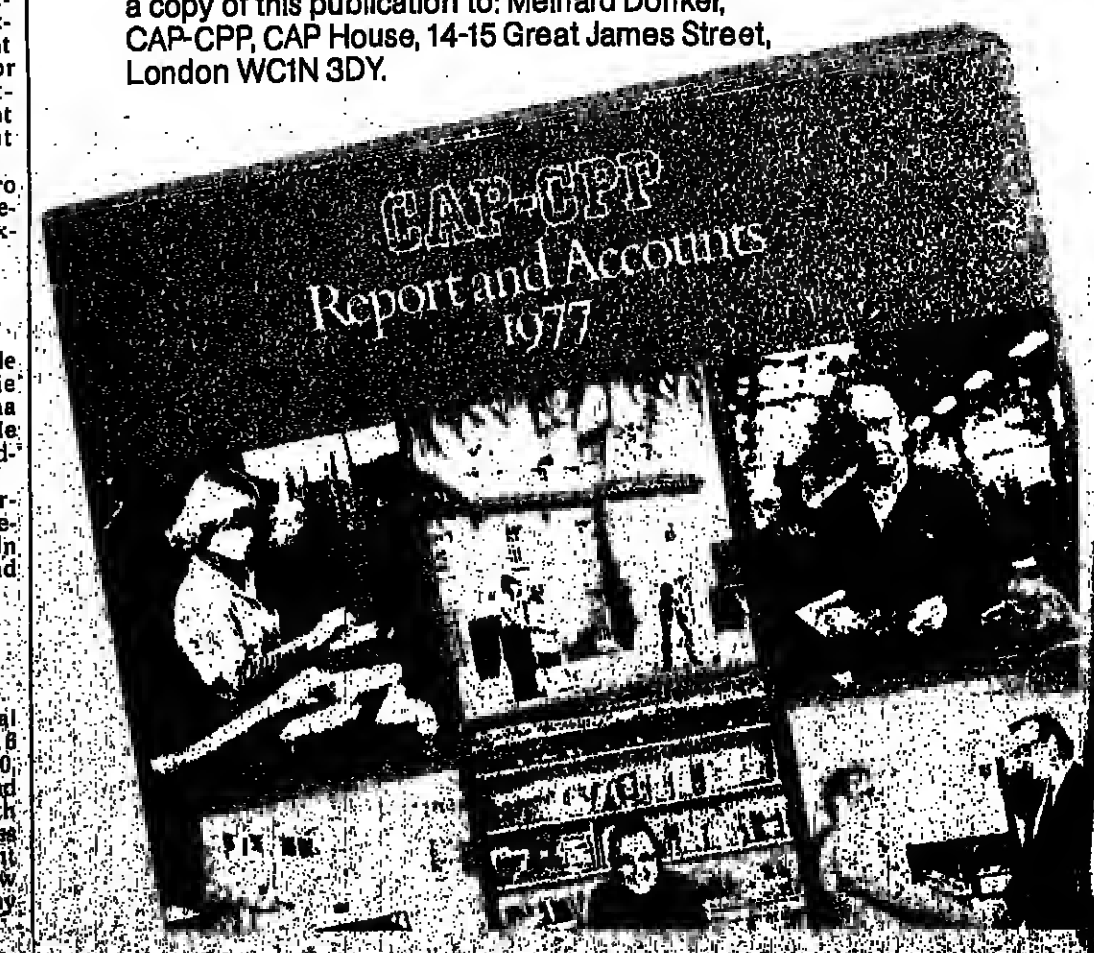
## CAP-CPP

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## MICRO NEWS

Edited by Martin Banks

# Single chip system trendsetter of year

IF trends in microcomputing can be said to have any significance, the most interesting developments of the past year have occurred in the single chip "system" area. To be sure, some of the hardware will not be available until next year, but recent announcements from Intel, Zilog and Motorola have all pointed to the route that the micro manufacturers are planning to follow.

To a large extent, the significance of the announcement of the Intel 8021, the Zilog Z-8 and Motorola 6801 lies not in the products themselves, but in what they represent as a technological trend. All are being aimed at applications where a relatively small amount of memory coupled with some I/O capability can be employed with the minimum of extraneous design activity on the part of the user. One chip and just a few additional components can be engineered into a working system with a minimum of expertise.

The applications themselves, certainly in computing terms, do not yet represent a dynamic advance, coming as they do in the form of process control operations and slightly less than morose terminals. But as a level of

## NS data capture system

CLAIMED to be the first single chip data acquisition system, the National Semiconductor ADC0816 can be used to replace up to £100 worth of analogue to digital conversion equipment in a variety of applications.

Included on the chip are an 8-bit analogue to digital converter with Tri-State latched outputs, a 18-channel expandable multiplexer with address

input latches and provision for handling external signal conditioning.

Housed in a 40-pin package, the device can perform a conversion in 50 microseconds, and is particularly suited to medical instruments, process control, industrial control and machine control. In quantities of 100, the device is priced at £12.95.

## Courses on Rockwell 6500

FOLLOWING the decision of Rockwell to manufacture the 6500 family of microprocessors designed by MOS Technology, its UK distributor, Pelco Electronics has instituted a series of three-day courses covering the basic theory and hardware of the device.

The main aim of the course will be to initiate participants into the practical use of the main 6500 family design aids, the KIM-1 and System 05.

One course will be run each month during 1978, with a maximum of six engineers per course.

The fee will be £85 per person. Further information can be obtained from Pelco at Enterprise House, 83/85 Western Road, Hove, Sussex BN3 1JB.

## Memories stocked

OFF the shelf delivery of Intel add-on memory systems for Digital Equipment LSI-11 computers can now be obtained from Rapid Recall.

Typical of the systems to be stocked is the In-1611, which is said to offer better performance than its DEC counterpart for less money and in less space.

integration over current products, and with a price reduction of traditional semiconductor proportions, they represent a significant step down the road towards the real single chip computer system.

The introduction of these products must also be considered in relation to the other major developments from these three companies, the Intel 8086, Zilog Z-8000 and the Motorola MACS. All are 16-bit processors with a computing power that will be equivalent to systems from the Digital Equipment PDP-11 range. They represent the semiconductor companies' continued push for greater integration and computing power. They will be expensive and require considerable initial expertise in their implementation. They will, however, follow and extend the pattern now being set by the 8021, Z-8 and 6801.

Perhaps the other most significant event of the past year has occurred in the related area of semiconductor memory devices. The manufacturers, dominated as they are by the requirement of maintaining high volume production, have established a long tradition of price attrition as a means of expanding the available market for a

product. With 4K static RAMs however, the market itself pre-empted the manufacturer's rate of price cuts, and orders flooded in based on the premise that the price would be right come delivery day.

The volume of orders for the part has, however, far exceeded the rate at which the part can be produced. It will now be some time before orders are fulfilled and the price becomes "right".

Finally, on a different tack from the industry proper, Lynx Electronics made the potentially significant discovery that a UK hobby computer market may exist after all. At its Wembley seminar, it sold 98 Nascom 1 computer kits, bringing the total sold to over 300 (CW, December 8). Virtually all were bought sight unseen, even though the price tag is about £200. Who said the British were a cautious race?

## OP SPOT

TO carry out his function effectively, an operations manager needs to be familiar with many subjects. He plays the role of a psychologist when dealing with personnel or recruiting new staff; that of an economist when considering his DP budget for the coming year; and must be able to communicate with programmers and engineers regarding technical matters. Add to all this the fact that he must be aware of the problems of users and it becomes clear that his task is varied and complicated.

Firstly, the DP budget concerns capital expenditure such as the purchase of new peripherals, core storage, VDUs and ancillary equipment. In this regard the operations manager should have an up-to-date knowledge of the equipment available, the relative costs and its worth to his installation.

Secondly, it involves staff salaries and the manner in which they are calculated. Here he is restricted by the manner in which the company awards pay rises, by government legislation, and possibly by the trade union to which his operators belong.

Ideally, increments should be related directly to the true value of each operator in the installation. They should be linked to staff appraisal taking place every three or six

## Gosmac VIP hobby computer kit

ANOTHER company about to enter the UK hobby computer market is RCA Solid State with its Gosmac VIP computer kit. Based on the company's CMOS-manufactured CD 1802 processor, the kits are currently being modified to work directly with PAL standard televisions.

Priced in the US at \$278, the kit consists of a single printed circuit card on which are mounted 2K bytes of RAM, 812 bytes of ROM, a hexadecimal keyboard, 100 byte per second cassette interface and power supply.

The ROM is utilised to hold the operating system, which provides such facilities as direct interfacing with a TV, simplified loading of RAM, data transfer from RAM to cassette and single stepping of programs. Easy expandability has been made a prime feature of the kit, and an expansion board is available that can accommodate up to 32K bytes of additional RAM, plus a further 15 input/output lines.



Visitors to the Plessey stand, at Systems '77 Munich, discussing the Miproc 16-AS high speed microcomputer system with Alan Senior (left), Microsystems sales manager in Germany.

## Impressive debut

THE Plessey Miproc 16-AS microcomputer system, which made its public debut in Germany at Systems '77, has found a ready market with Krautkramer GmbH, a Cologne-based manufacturer of ultrasonic non-destructive testing equipment.

Six systems have been sold to the company, where they will be used as high speed controllers in automatic test equipment used in the production of high grade

stainless steel tubing. The tubing has to be tested for internal and external diameters, plus wall thickness, and the testing has to take place while the tube is rotating at 2000 rpm and being fed through the tester at one metre per second.

Plessey has also sold nine systems to Quaye DV, a specialist systems house located in Knaul, near Düsseldorf. These will be used in process control.

By Bernard Allen

## The manager—man for all seasons

months and the operations manager should consult the shift-leaders when putting his views to the DPM.

In this context, each operator should be told how well, or badly, he is doing. If the respect of his staff is vital to an operations manager then he should try to gain it. In this matter it is important that he does not become a mouthpiece of his DPM's views — and also that he does not accede to his staff too often.

After defining installation procedures and regulations, he must ensure that his directives are followed fully by the operators and must support his staff, should disputes with related departments occur.

At many installations it is a rule that only operators, engineers and systems programmers, when requiring "hands-on" time, are allowed to enter the computer room. It is important that the operations manager does not alter this rule under any circumstances.

This is particularly annoying and disheartening for the console operator who has taken

the time and trouble to plan the order of his workload. Such planning usually involves the setting-up of job queues and the mounting of discs.

While his foremost consideration must be the service accorded to users, he must not allow them to dictate either to himself or to his staff. For example, if a member of payroll staff has to wait for his output longer than usual due to a printer being out of service, the operations manager should inform the person of the cause of the delay and not allow the work schedule to be disrupted, except in extreme circumstances.

Although reminding attached to a certain extent in scheduling with staff, he must be able to communicate with them on all matters regarding work. This balance between detachment and communication is difficult to achieve and maintain, but is important.

A good opportunity to relate to personnel occurs at staff meetings, but these are often restricted to senior operators, shift-leaders and the operations manager.

An excellent idea is to allow a different member of each shift to attend the meeting on each occasion, whether they be a senior operator, operator or trainee. This enables all staff to get a much broader view of the running of the installation, and a greater awareness of the problems to be overcome. Such a scheme leads to more interest on behalf of the staff, because apathy can arise when operators lack encouragement.

The manager must be able to accept constructive criticism from his staff and, in the appropriate situation, act upon it. Operators regularly have good ideas about the manner in which the computer room is organised and run, but are rarely given encouragement. When talking to operators and discussing their abilities and shortcomings with staff, it is essential that the manager gets an accurate assessment which will help him to ensure that each shift has a balanced staff.

Closely akin to this is the recruitment of staff, and the operations manager must be able to assess a candidate and consider if he will fit into the installation.

The operations manager has a great deal of responsibility to his company, his staff, and above all to himself.

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## DOWNTIME CHRISTMAS SPECIAL

# Bootstrap to oblivion

## By Christopher Hodder-Williams

AT exactly 23.57 hours East African Time, Martin Hillman pulled on to the car park at Rempana City Centre. It was a busy place even at this time of night. Cars were parked in all the wrong bays. This always annoyed Martin. He was punctilious, exact. He wanted things to be orderly. He did his own thing in an orderly way — he was the best shift supervisor at the Computer Centre — so why couldn't other people?

The stock exchange for this irritating degree of disorder was the guerrilla warfare being waged by President Patani, self-appointed dictator of the neighbouring state. Patani ate like an updated Farouk, drank like Nero and ran his state like Caligula. It was hard to take this micro-Hitler seriously.

In Rempana there had just been one of President Patani's magnificent air raids. His entire air force, which consisted of 11 Crusaders, had scattered incendiaries in all the wrong places. Most of them fell in the river, thus creating a thrilling fireworks display much admired by the populace. Of the two buildings hit, one was the US Embassy. The Americans had provided Patani with the Crusaders. "The world is mad," said the operator coming off shift.

Martin said, "The CIA don't do their homework in time. It took them two years to realise that Patani was treated for paranoia in one of Michigan's more luxurious psychiatric homes before they finally went down on him. I think I can smell the American Ambassador's dinner — T-bone steak, very overdone. Everything in order, up here?"

"Yes, Mr Hillman. Biggest program running is the census. It's all on file now and we're just running the final check on the S to Zs. But it's virtually in the can, now."

"Anything on the printer yet?"

"Only a few rude remarks from the validation software asking us if we've forgotten what 'alphabetical order' means."

"I agree with the software; we should have got it together by now."

"Anyway, we've got it all in the machine."

Martin said, "Then let's get it all out." He signed over from the retiring supervisor. "And please take your coke cans with you," he added — then sighed resignedly as Wilbur, the American, strolled in from the date preparation room. Wilbur, who thought himself funny, was a six foot bore with quizzical eyes, sketched in hair and a disarmingly ill-conceived approach to women. "Evening, Martin. Sanderson wants to have a little chat with you in his office."

"Noted, Wilbur. All input floppies for the census must be shredded, together with any correction cards."

Wilbur said, "They already are. I've sent them off to the

breakfast cereal factory." A tedious grin went with this.

"Incorporate them right now." "That's done."

"Good. Why is Sanderson here so late?" Sanderson was data processing manager. Normally he observed only office hours.

"You'd better ask him. His condition is interesting. If he were human, I'd say he was in a distinctly neurotic state. But automated devices like Sanderson do not suffer from neurosis, so it must be something else. He is merely overheated. So just take a cooling fan and you'll find all his LSIAs go back to normal."

"Maybe he's been the victim of too many of your jokes, Wilbur."

"He's not coming over funny."

"That's what I meant."

"SHUT the door, Martin." Sanderson looked grim. Also frightened. There was certainly nothing mechanical about him — but then Wilbur's attempt at what usually gave away more about Wilbur than his prey. Wilbur hadn't got a girl — an

unfashionable state of affairs in Rempana which, according to the travel brochures, was "Exotic, erotic Rempana, where beautiful girls were more plentiful on the beach than the pebbles. Wilbur only found the pebbles, and onlookers proclaimed that if he suddenly did find a girl among them he'd turn her instantly to stone."

"Martin, someone's been abusing our communications channels."

"How? They can't open up the system without a badge number."

Sanderson got up artificially and hobbled over to a wall diagram. "The installation at Jennah."

Martin said flatly, "That means Patani's man has got into the Intelligence Post. But how the hell —"

"A badge number is not a great deal of use if the operator's got a gun in his back."

"How long has Patani's vanguard been using the remote terminal?"

Sanderson limped back to his chair. "Long enough to get what

they wanted."

Martin said, "I don't see what you're so shut-up about. There's no online software here except for basic file interrogation. Patani isn't going to amuse himself with a population census."

"Too right. . . Anyway, I've done the classic thing of locking the stable door after the horse has bolted. Cut the line."

"I still don't see —"

"They've gone clean through here by using RJE to Nairobi. There is a classified package there called TAKNUKE." Sanderson rapped out the solution to the mnemonic. "Trajectory, ozimoth, kinetics for nuclear kayed enumeration. . . If you get the idea."

Martin said, "Patani's delusions of grandeur must have gone critical. How did he get the password for the package?"

Sanderson said flatly, "Does it matter? He got it."

Martin said, "Considering Patani has to go on his hands and knees for basic ammunition, why are you taking this seriously? The man's a nut. Don't think me impertinent, Sanderson, but why get the shits about the latest thing in Amint?"

He stared at the empty whisky bottle on the desk, wondering if the heat had gone to Sanderson's brain. "Tactical Nuclear Weapons can't exactly be bought in any local duka."

Sanderson stared back with eyes blurred from alcohol. "Are you saying there's no such thing as a black market in nukes?"

Which was the instant when Martin wondered, once again, about the structure of Ngara's garage. The conversation about it had taken place only a few minutes before he'd left home to go on shift.

MARTIN said, "I've just seen that garage Ngara has been building. It's odd."

Erika said, "You're going to be late on shift." Her mind wasn't on Ngara's garage. She was wondering how close the border fighting was going to get. Up till now, she'd regarded it as nothing much more than an occupational hazard; if you chose to live in the uneasy political climate of East Africa you had to live in the hills, as near to Rempana, where Martin had such a good job with the government, life was detestable.

"He's not. . . no more and no less interested in Ngara — or his bottom — than you are in his girl, Martin."

"It wasn't Katine I made pregnant, it was you. Where are my keys?"

She picked them up off the dresser and jingled them at him. "You keep your mind off Katine and on those computers. Anyway, what's wrong with Ngara's garage?"

"I personally wouldn't have used nine feet of concrete."

He crunched the gravel out to his car.

Ngara's house, another wooden bungalow very similar to Martin and Erika Hillman's place, stood a few hundred metres to the south, toward the main road and the lake. A few lights shone there. Soon they'd be out; Katine, black and provocative, was attractive in the opposite sense from Erika. Erika was rounded and yielding at the touch; Ngara's girl was streamlined and taut. It was true, Martin had once made a pass at her, down by the lake. She'd pushed him into the water, fully clothed. He'd climbed out grinning, his Keds looking more forlorn than ever. He said, "Shoving me in the water won't stop you looking a million dollars."

Katine said thoughtfully, "Wasn't Erika a trained nurse, before she married you?"

"That's right."

The place was nothing less than a playground.

But now, some were saying that the vanguard of President Patani's troops had established a sort of fifth column very close to Jennah, the little township up the road. Jennah was a suburb of Rempana itself — the capital — and was where Erika did the shopping in Jennah's only duka. You bought everything there. . . bulbs for the garden, bulbs for the lights; excellent beef from locally reared stock; kerosene and butter, which often sawed of each other; toys for Cindy, who broke them; mosquito nets and envelopes; jeans for Erika who looked good in them even when — as now — she was two months pregnant; KD shorts for Martin, whom they never fitted.

A hall of mortar bombs went off between Jennah and the valley, sending showers of sparks overhead until they seemed to mingle with the stars.

Martin said, "I'm never late on shift."

"In that case you've got time to change out of those awful shorts. They're baggy on you. Put on some weight, darling, or chuck them out."

"Who the hell puts on weight in this heat?"

"Who the hell wears shorts? Ngara doesn't."

"Ngara is black," Martin said. "So what?" She examined, with disapproval, the fit of Martin's KD shorts. "If you had a bottom like Ngara's."

"Mine isn't going to look like Ngara's just by stuffing myself with potatoes. He was born with it. So don't get kinky — and where on earth are the car keys?"

He checked the stuff in his briefcase. They weren't there.

"I'm no more and no less interested in Ngara — or his bottom — than you are in his girl, Martin."

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"That's right."

"She may need all her nursing experience for your benefit, if Ngara catches you kissing me again. But you do look funny, when you're drenched. Go and explain to Erika how you got drenched. You shall now buy her a present. You are a guilty man. . ."

Martin inserted the keys in the ignition but he didn't start the engine for a moment. He felt uneasy about many things. Was

information than I've given you already. Use my phone. Make the call. Just a small block of passengers on an outbound plane — that's all I'm asking."

Martin spoke contemptuously. "If that's the way you feel, you'd better use the phone right now and get a directive from the British Embassy concerning the safety of British nationals."

"They'll say there's insufficient proof for emergency action."

"Then they're probably right."

Sanderson leapt up. "Are you going to use that phone, or not?"

"Only to get you a box of tranquilisers."

Sanderson said through dry lips, "I don't think they'll be all that effective against what Patani has managed to get hold of now."

"The heat in the DP manager's office seemed to have doubled within five minutes. For the first time Martin felt it just possible that Sanderson's fears had at least some foundation in fact. Maybe it was just possible that Patani had ideas about using some kind of TNW. What Martin couldn't stomach was the total emasculation of a senior DP man."

Sanderson leaped back. Sweet was pouring down him, by now. "Okay, Martin. I gave you your chance. You're refusing to take it. I'm chartering the first aircraft I can get hold of and pushing off to Nairobi."

Martin stared at the man, dumbfounded. "You know as well as I do there's only one plane you can get hold of — and that's a three-seater. You have a wife and four children and you can't fly. That means you and a pilot and one other."

"That's the score."

As if to punctuate Sanderson's comment, a heavy explosion, not very far distant, shook the windows violently.

Sanderson's lips had gone blue. He tried to say something but the words wouldn't come out. Martin had never seen such a terror in a man. An HE shell had struck a building and gone off. Once every few days this had been happening, but it was considered routine. Patani was known to be almost hysterically short of ammunition and his gunners wouldn't have passed a recruit course on target practice. Probably the HE shell had hit the old quarter — now ruins and unoccupied.

Yet Sanderson rushed to the window and flung it open. On the sill lay the Polaroid camera.

"I've never known you pleased enough to do so. But since you won't give me any facts —"

"I can't even tell you what I know."

"Listen, Sanderson, if Patani's got something nasty up his sleeve that I don't know about, do we just beat it secretly and leave everyone else to fry?"

"For Christ's sake get on to your father! He must have influence, surely? Enough to get us out of an aircraft?"

"He might have. But —"

"But you listen to me. The government of this country has recently taken aerial shots in the Jennah area and they know there are microwave dishes where there shouldn't be. Microwave dishes and a hell of a lot of unidentified stuff that Patani's guerrillas have moved in."

He tried to wipe sweat from his brow but his shirt was already saturated.

There is also one hell of a lot of unexplained activity and we are well within tactical missile range, as you know. More than that, I cannot say. In Rempana you can be shot for leaking lies

leave you got a Polaroid camera for?"

"Ever known me go off half-cocked?"

"I've never known you pleased enough to do so. But since you won't give me any facts —"

"I can't even tell you what I know."

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"That's the score."

As if to punctuate Sanderson's comment, a heavy explosion, not very far distant, shook the windows violently.

Sanderson's lips had gone blue. He tried to say something but the words wouldn't come out. Martin had never seen such a terror in a man. An HE shell had struck a building and gone off. Once every few days this had been happening, but it was considered routine. Patani was known to be almost hysterically short of ammunition and his gunners wouldn't have passed a recruit course on target practice. Probably the HE shell had hit the old quarter — now ruins and unoccupied.

Yet Sanderson rushed to the window and flung it open. On the sill lay the Polaroid camera.

"I've never known you pleased enough to do so. But since you won't give me any facts —"

"I can't even tell you what I know."

"Listen, Sanderson, if Patani's got something nasty up his sleeve that I don't know about, do we just beat it secretly and leave everyone else to fry?"

"For Christ's sake get on to your father! He must have influence, surely? Enough to get us out of an aircraft?"

"He might have. But —"

"But you listen to me. The government of this country has recently taken aerial shots in the Jennah area and they know there are microwave dishes where there shouldn't be. Microwave dishes and a hell of a lot of unidentified stuff that Patani's guerrillas have moved in."

He tried to wipe sweat from his brow but his shirt was already saturated.

There is also one hell of a lot of unexplained activity and we are well within tactical missile range, as you know. More than that, I cannot say. In Rempana you can be shot for leaking lies

In 1968 Christopher Hodder-Williams' book *Fiatful of Digite* was published. It was the culmination of a number of years of campaigning by a group which ranged from computer scientists to psychiatrists. The aim of the campaign was to try to alert society to the impact of information technology — a requirement that grows more urgent as time goes by. In this specially commissioned story for *Computer Weekly*, Hodder-Williams continues his exploration of the way man, machine and society might interact in the future.

Sanderson grabbed it and took a random shot at the brightly lit street outside. Sobbing now, he counted the seconds, then stripped the backing off the plate.

A very uninspired colour photograph of no almost deserted street was the net result.

Martin glanced down at it for a few seconds, then left the room.

HE took over the shift but his mind wasn't on computers. He had seen a man he'd respected suddenly go to pieces as if some unseen metaphysical force had performed psychological vivisection. Having checked that the batchwork was running up to date and the online systems were in order, Martin went thoughtfully to the phone and dialled a number. To the man at the far end he said, "This last shift where did it go off, do you know?"

He was told it was a small HE rocket that had hit a carport warehouse in Lower Punt. There were no casualties but a small fire had broken out. Fire-fighting equipment was on the way to the scene.

"Did anyone photograph it?" Martin asked.

"Who'd print it?"

Wilbur, who had strolled up from the data prep room, wanted to know what all the fuss was about.

Martin said, "Why would a man take a shot of an empty street, Wilbur, with a Polaroid camera, just after an HE shell had exploded several miles away?"

"Is that the clue to today's crossword?"

But Martin was dialling again. "It's the clue to something. Get lost, will you?"

Wilbur said, "That's all people ever say to me. Get lost. What is it that makes me such a thrill?"

"I don't know. Go and play with a pebble. . . Erika, that you?"

"What a time to phone. Are you about to confess? A neighbour has grassed on you, Martin. I'm trying to decide whether to

be annoyed about it."

"About what?"

"About your unachieved dive into the lake."

"Erika, listen very carefully — as never before."

"You sound. . . scared."

"Just listen. Phone Ngara the moment I've finished talking. You know that garage he's just built?"

"The one you were so rude about?"

"The one I was so dumb about. Immediately you've hung up, get Cindy out of bed. Grab a few of her toys. Pack a few cans of fruit juice and cola and milk and a few cans of food. When you phone Ngara tell him I know why he built the garage with nine foot concrete. Tell him it's time you all got in there."

"What in God's name —"

"Don't ask questions. You're carrying our baby and you've also got Cindy. I want you in that garage."

"Promise to phone later?"

"I'll phone you at Ngara's if I get the opportunity."

"And what about you?"

"I'll tell you all about me when I phone you back at Ngara's. Hang up now."

Martin walked briskly through the bright doors of the computer room. It was

operator who had come on shift with him was checking some printout. Martin asked him, "Everything okay?"

"Sure, Mr Hillman. I hope they don't do another census for a while, though. If we go on at this rate we'll run out of mag tape."

"When do you start printing the results of the census itself?"

"The moment it's validated. Shouldn't be long now. There'll be enough paper to reach from here to the arse-end of the Nile when we're through."

The squawkbox buzzed. Martin snatched it up. It was Wilbur, speaking from the data prep room. Wilbur said, "Just now Sanderson drove off like a scalded cat. . . well, about ten minutes ago. Tyre rubber all over the car park. It may leave a very nasty smell. What cooks?"

Martin snapped grimly, "Just let's do our job, Wilbur. Whatever race Sanderson has just entered, I doubt if he'll win."

Just as Martin cleared down on the squawkbox there came another explosion. It seemed muffled, quite different to the one before. And long before the echo of it had died down, every warning light on the central processor started flashing. At the same time all tape decks stopped. There was no power failure; the lights stayed on, the fans continued to run normally.

Martin stopped breathing, stood very still, a statue in the computer room. The operator looked up at him, then back at the flashing lights. "Computer's down, Mr Hillman. Why?"

"Because there won't be a thing left on your magnetic tapes. Same applies to the disc packs. Try the tape library and you'll find every tape erased."

"I'm sorry, you've got me puzzled, Mr Hillman. Is this some kind of a joke?"

"Do I look as if I'm joking?"

"You look. . . as if you've just seen a ghost."

Martin knew the most appropriate reply to this but he didn't give it. "I'm just going down to Mr Sanderson's office."

"He's just left."

"It's his camera I want." Martin paused by the doors. "What have you got printed out so far?"

"Only an error check."

"How's it read?"

"We're clear. Ready to roll."

"Load a test tape on Deck 2. See if you get anything."

"Will do."

Martin dashed down to Sanderson's office. He knew there was no need to take a picture. He just stripped the backing off one of the unused plates.

The plate was pitch black.

Martin returned to the computer suite. He could see from the lights that the test tape was completely blank.

"The operator said, 'So what's this? African black magic?'"

"Don't you know what wipes magnetic tape faster than anything else?"

"The man caught Martin's look and suddenly became very frightened. 'No air! What?'"

"Radiation."

"But there was. . . hardly a bang at all."

"Neutron bomb. Leaves a rotten little mushroom cloud but — but it turns you rotten!"

"Got any Nambuto?"

"I'd rather not."

"Please yourself." Martin dialled Ngara's number.

Hodder-Williams himself has a lifestyle that might be typical of the Eighties, as he easily integrates literary and technological activities.



## DOWNTIME CHRISTMAS SPECIAL

## Poet-free

## Ton

Speed  
Is exhilarating when  
A cow in the road around the corner  
Means death.

Power  
Is relentless when  
A cow in the road around the corner  
Means death.

Time  
Cannot exist when  
A cow in the road around the corner  
Means death.

Why be afraid of  
Death when  
Death  
Is just a  
Cow in the road around the corner?

Tim Palmer

EPSS—  
S.W.A.L.K.

I addressed the packet  
with binary coded,  
loving care —  
for someone,  
somewhere  
was waiting  
for a message from me

I ordered (InconSequentially)  
each bit  
of each byte  
to form for you  
a love letter true  
(a heartfelt ditty  
written to standards set  
by the CCITT)

and although,  
like eggs on toast,  
your reply was scrambled  
in the electronic post,  
it was no snag  
to unravel:  
I LOVE YOU (anag)

Oh Yes,  
keeping in touch is so nice  
with the Post Office's  
Experimental  
Packet Switching Service

Malcolm Peltu

19th Nervous  
JCL STATEMENT

It really doesn't matter, you know, it's  
Just a game it's  
Not important. Not compared with  
Whether Palace won on Saturday or  
If Rodney will make it in number  
One next week.  
The world won't come to an  
End it  
Won't prevent the Thames flooding most of  
Central  
London before the  
Barrier is built, won't even  
Affect the supply of crumpets, stop  
The spinrows switching on in Leicester Square  
at  
Four pm precisely. And that pretty typist in  
Personnel will still  
Smile or  
Not smile to-  
morrow as the case may be whether I  
BM puts M  
VS on the E-series or  
Not.

Tim Palmer

## Big O.S. Man

He'd been a trusted  
program member  
of the largest  
operating system  
in the world,  
ever since the early  
illicit bootstrapping days

but when he failed to update  
his store protection dues  
The Supervisor ordered  
his privilege bits unset  
and he was placed  
on The Queue Minder's list:

soon to be erased

Malcolm Peltu

## Tidying up

It's been a long shift since the year began,  
And there is much to shed and shed;  
No time now to try to feed  
Those valid statements still unfed  
Into the silent terminal,  
Nor yet to follow up instead  
Ideas, however germinal.

I've checked the logs, the discs, the tapes,  
Updated every manual in the place;  
Slave units' shackles briefly loosened  
And every bug that I could trace  
Is ironed out;  
Downtime approaches at a petty pace—  
Yet still I doubt...

I fear that when next year's shift starts  
All this year's private mess will lie  
Swept beneath the mind's false floor,  
Deceiving no one but the eye  
Of the beholder;  
No fresh new start, then? But I—  
Shall be one year older.

Note for myself for New Year's Day:  
I've charted the flow of my life so far,  
Diverted the course of some endless loops;  
Now document just how things are,  
And note this fact:  
Wherever I go, however far,  
Starts with this act:  
Begin

Don Mitchell

## Really Basic

BASICALLY speaking  
you are the API  
of my core;  
the program body  
I must adore

You are the end  
to my each beg  
and your smile makes  
even the ugliest bug grin

To your each sweet CALL  
I must OBEY,  
looping round  
your love routine,  
like a spider  
with its prey

Without you I'd ABEND,  
for I am just a variable  
for a constant called you;  
and I've nowhere else  
to GO TO

Malcolm Peltu

## The Watcher

The Watcher stands  
Atop the hill,  
Witness to the silent mill,

Relics and ruins are  
His to see, all that  
Was, and ceased to be.

Time honoured symbols  
Of Man remain,  
Jutting above Watcher's humble  
Plane,  
He has no smile,  
He has no mirth,  
He has no birth.

The Watcher stands  
Atop the hill,  
Witness to the silent mill,  
A river runs close,  
Winding away,  
He cares but little,  
It is always there the  
Next day.  
Buildings echo with the fallings of Man,  
Down, along the streets they ran.

With a fiery blast,  
The sun disappears,  
Another day gone, or is it a year?

That too remains, a thing of  
That night which holds  
Fireflies,  
Twinkling so bright.

Earth is born,  
A star looms above,  
Minn was created,  
Created with love.  
Now that is gone,  
Earth is alone,  
Man has fled his wondrous,  
Faithful, abode.

The Watcher stands,  
Atop the hill,  
Witness to the silent  
Mill,  
Relics and ruins are  
His to see,  
All that was and ceased to be.

Watcher, you with mortal eyes,  
Can you atoms body show  
Earthly surprise?  
You were the beginning,  
A beginning in the end,  
Every angel,  
Did you have to descend?

Robin Webster

## CHESSLAB CHRISTMAS QUIZ

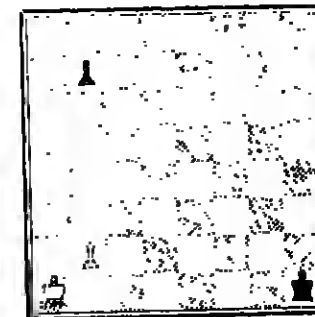
## End (of year) games...

To combat the end-of-year fatigue and lassitude which may already have set in, Chesslab this week presents 20 questions guaranteed to stir the system (human, or perhaps even machine) into action. The quiz was compiled by Danny Kopeck and Donald Michie of Edinburgh University, and Michael Clarke of Queen Mary College, London. Answers appear on page 39.

A. The six king-pawn-king-pawn studies given below were composed with computer assistance. Find White's move in each case.



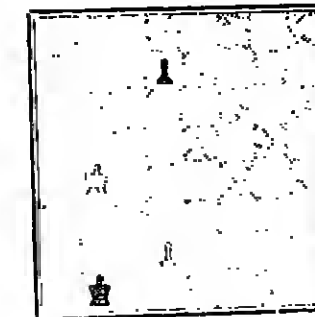
A1 White to draw



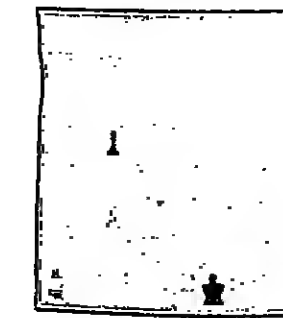
A2 White to win



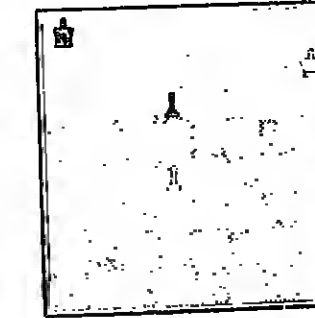
A3 White to draw



A4 White to win

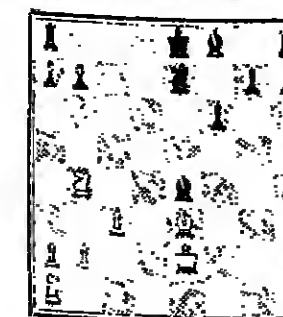


A5 White to draw

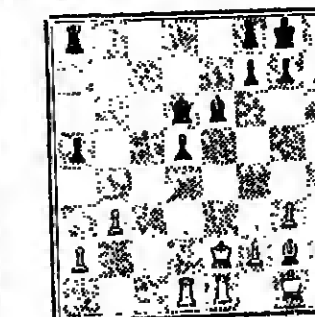


A6 White to win

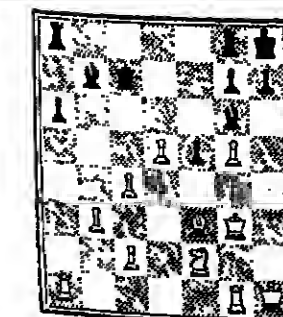
B. In each of the three position-pairs which follow, one is taken from a computer chess tournament and one from a Bobby Fischer game. Which is the Fischer game in each case?



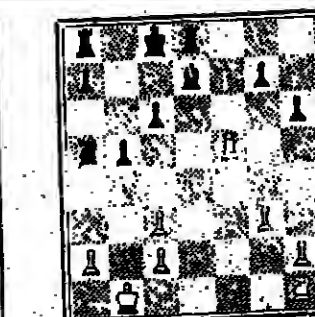
B1 (1)



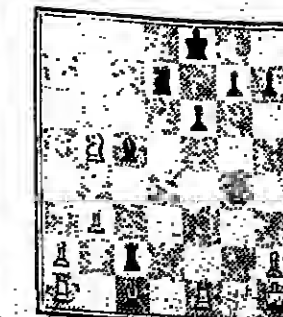
B1 (2)



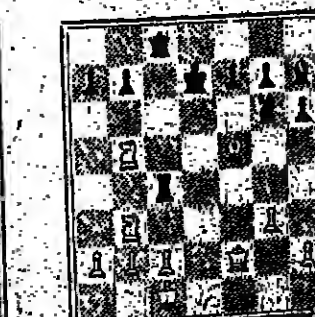
B2 (1)



B2 (2)

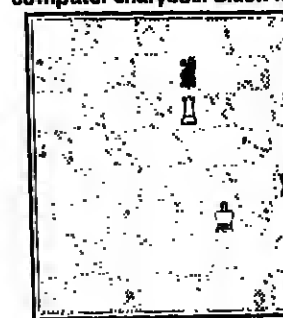


B3 (1)



B3 (2)

C. The following studies of the defence of king and knight against king and rook emerged from computer analyses. Black is to move and draw; find his only correct move in each case.



C1



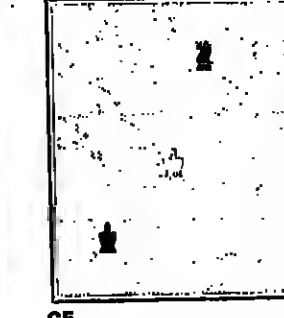
C2



C3



C4



C5



C6

D. Who said:

D1. "It is hopeless to try to make a machine play perfect chess?"

D2. "In ten years a computer program will be World Chess Champion?"

D3. "There is no reason why a program based on such 'type positions' could not be constructed. This would require, however, a rather formidable analysis of the game?"

D4. "A real success — the production of great games and not just the avoidance of blunders — in the attempt to mechanise chess must at the very least teach us a good deal about the nature of thought?"

D5. "Chess problems are the hymn-tunes of mathematics?"

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Al Barnett  
Tony Vann  
Terry Lawn

## When Elvis died

Where were you when Elvis Presley died?  
I was somewhere back in the Sixties  
in a Chelmsford spaghetti factory with you.

IT IS ELEVEN O'CLOCK  
the very loudspeaker blared  
TIME FOR THE NEWS.  
ELVIS PRESLEY HAS DIED.

We laughed, it was so unreal.  
We had no time for the news  
that Elvis had died.

But then the wake began  
and it was heartbreaking Hotel  
all through the night

"It's amazing," I said.  
"The end of an era, the start of old age."  
"Rubbish," you replied  
"It doesn't matter at all.  
He never really lived,  
so he never really died."

Angry, I turned on you,  
spaghetti tentacles flaring from my mouth,  
"Elvis has died, Gods shouldn't die."

Later, Groucho went too.  
"Time wounds all heels," he once quipped.  
Only this time it was fatal.

But you were right, of course.  
They both live in eternal dream machines.

Elvis thrashing in wax grooves,  
Groucho crouch-walking  
across a million screens.

And me?  
I'm afraid I'm still lost  
somewhere back in the Sixties.  
Stuck fast in trend-setting glue.

With no wax in which to groove,  
no celluloid to keep me warm.

Malcolm Peltu



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## Plug-compatible Sigmas through design stages

THE plug-compatible Sigma 9 and Sigma 11 processors under development at Telefile are through their design stages. The Sigma 9 should be available in the first quarter of 1979, with the Sigma 11 a little later.

### Online booking system for shipping firm

AN online passenger booking system for the British and Irish Steam Packet Co is to be implemented by Leasco Software Ireland. The system will be based on twin Digital Equipment PDP11/70s in Dublin, linked to 50 VDUs in the main offices of the company in the UK and Ireland.

Hardware for the system, valued at £520,000, includes £120,000 for data communications equipment, while software development for the project will cost £200,000.

Due to go live in 1979, the service will process reservations for passengers, cars, and berths. The computer will also handle part of the firm's freight operations.

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## MDS wins \$10m Series 21 business

THE product on which MDS is staking its future, the Series 21 data entry/processing terminal cluster (CW, May 13), has provided the company with about \$10 million worth of business in Europe in 1977. Nearly 600 systems have been ordered or installed by customers. They include Trust House Forte and the Wellcome Foundation in the UK.

Managing director of MDS in the UK, Ray Skinner, says that many of the Series 21 orders placed are for one or two units and could be followed up by multiple orders. Trust House

Forte, for example, has one Series 21 system at its catering division's headquarters at Chess, Surrey, but plans to install several more at other locations.

About 30 systems have been shipped in the UK to date, and Skinner points out that UK sales should be given a boost early in 1978 with the introduction of an ICL 7502/7503 compatible



Ray Skinner

version of the Series 21.

Europe accounted for about \$35 million of the \$72 million turnover notched up by MDS worldwide in the first six months, ended October 31, of its current financial year. But about 60% of the turnover came from rentals on installed equipment as opposed to sales, and MDS is not prepared to reveal the value of new contracts picked up for its older products, of which the MDS 2400 key-to-disc system is by far the most important.

Some of the latest contracts for MDS 2400 systems include two from the shipping industry. The Mersey Docks and Harbour Company has installed a 2400 to capture payroll and other data for processing on its IBM 370/135 mainframe, while Atlantic Container Line, the Southampton-based international consortium, has ordered a 2400 system and five MDS 6403 communicating data recorders to act as backup to its online network, SPEED (CW, February 10).

## How stars are born

COMPUTER-AIDED studies of instellar gas clouds in the constellation of Orion have produced evidence supporting a theory that stars are being formed at many points throughout the cloud as it collapses.

An analysis of the data obtained appears in the November issue of the Astrophysical Journal, and authors of the article are Dr Frederick Fahlun, of the Department of Physics and Astronomy, University of South Florida, Dr Humberto Grola, of the IBM Thomas J. Watson Research Centre, and Dr Sabatino Sofia of the National Aeronautics and Space Administration.

Conventional theory holds that stars can be born only in the dense centre of a gas or dust cloud, where matter is

packed relatively densely. The new information, however, suggests that in the case of Orion, at least, stars are being born in the less dense areas as the cloud collapses to a common centre.

The technique used by the researchers was to analyse the movements of 140 candidate stars on an IBM 380/85 at Southern Florida. The movements were obtained from two groups of photographic plates about 40 years apart. The first set was taken between 1903 and 1926 at five different observatories, and the second batch between 1968 and 1974.

In an attempt to find the process that enables such stars to form, Dr Grola is using an IBM 370/168 at the Watson Research Centre, to simulate various chemical reactions that may occur in the cloud.

## Call for a Ministry of Computing

From front page

The main problem at present, according to the SCPS, was that "several departments or ministries" had developed, and that this led to a "lack of overall control and supervision, the likely result being the inefficient use of resources within the Civil Service."

It calls for "a separate authority with executive powers to be set up to control, co-ordinate and supervise the creation, execution and operation of major computer projects

within the Service, both existing and projected."

Also, because of higher pay in the private sector, Christie says that there is a current turnover of 20% a year at basic programmer level, with losses also occurring of senior and chief programmers.

To rectify this, immediate pay increases of more than £1,000 a year should be made. The major obstacle here, however, was "the rigid manner in which the government's pay policy was being applied in the public sector, while being largely ignored in the private sector."

## Trade or profession—actions louder than words

DP PERSONNEL should be more concerned with acting in a professional manner than being regarded as members of a profession, said Ted Cluff, vice-chairman of the DPMA. He was addressing a meeting of the BCS operations specialist group last week, considering whether operations should be regarded as a trade or profession.

"What really matters is how we as individuals are regarded by others — whether they believe it to be self-evident that we are behaving in a professional manner," he said.

DISC — an acronym for Dedication, Integrity, Sincerity and Competence.

The other speaker, Dick Waller, of CAP, said, "In DP people join as operators or programmers and in two years they are on £5,000 a year. From then on their income in real terms goes down because of family commitments and inflation until they retire — a sort of reversed apprenticeship."

He concluded, "Are operators a trade or profession? This is not a question I can answer. But I affirm very strongly that senior operations staff should be professional."

# Merry Christmas

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Wish all their ex-students throughout the UK a Merry Christmas and a Happy and Prosperous New Year and invite them to join us for a drink in the D.C. at lunchtime or evening on Thursday, 22 December

We are not sending cards this Christmas, but we do want to wish our many clients and friends in the computer industry a very merry Christmas, so here it is:

## A VERY MERRY CHRISTMAS

from The Interco Business Development Group

The Computer Industry Specialists in Marketing and Public Relations  
01-549 9751  
155 Clarence St.  
Kingston-Upon-Thames  
Surrey

## WELCOME TO CHRISTMAS MARKET PLACE!

This bumper issue of our popular small-ads feature is the biggest this year. We like to think that this reflects its effectiveness in selling goods and services for our advertisers — we have certainly had many favourable comments from our readers.

Computer Weekly's advertising staff would like to take this opportunity of thanking all Market Place advertisers for their wonderful support during 1977 and wish them and our readers a

## MERRY CHRISTMAS AND A HAPPY NEW YEAR

For further information on the availability of space and special positions within the Market Place feature for 1978

**TELEPHONE: STUART MOORE, 01-261 8109**

## FOR SALE

We have for sale a number of Honeywell G100 Computer Systems. Disc, tape or mixed configurations available. These are removed from the original user's installation and prices are from £500 upwards. Also less terms for short or long periods. Spare and software help are available but not engineering services. This offer could interest schools, technical colleges, etc.

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Equipment purchased in January 1976 and available in January 1978. All equipment maintained by D.E.C. and all prices exclude V.A.T. and are negotiable.

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# Appointments

## Systems Project Leaders and Analyst Programmers

### The Company

The Institution of Electrical Engineers is a non-profit making professional body whose main function is to provide a service to its members in the form of a professional information service for the Physics, Engineering and Computer Community.

In 1968 it became necessary to install a computer system to provide a database for the well established abstracts journals could be produced.

INSPEC currently uses an ICL 1902T computer with 84K words core, 8 tape decks, 3 EDS 60's, computer printer, card reader and 2 printers in the foreseeable future this configuration will be up-graded to provide an online service utilising a high level language for INSPEC and external customers

Magnetic tape services are now provided for companies and universities with computer based information services. This year INSPEC will provide over 150,000 abstracts. The journals and the database are distributed world-wide and the information is available on-line through the European Space Agency and the Lockheed Office Service based in the United States. Other INSPEC services include selective dissemination of information, key abstracts publications, and company current awareness services. The computer system is also used to produce publications for external users including encyclopaedias and lists of members of professional associations.

### The Job

Based at Hinchinbrooke House, the Systems Project Leaders will report to the Systems Controller and will be responsible for providing systems for the production of the database. This will involve dealing with the user department for external clients to established requirements.

producing specifications of systems, coding and system (both development and running costs) and the production of system specifications for programming

He or she will also write and test programs implementing the system, provide documentation on the system for the user, the data control section, and produce internal documentation to assist in modification of the system. Projects are handled individually or with a supporting team

Additionally Analysts Programmers are required who will be offering less qualifications and experience than the Systems Project Leaders. Programmers who wish to move into systems analysis work may also be suitable for these posts.

### Candidates

The Candidates must have experience of an assembly language, preferably PLAN. Experience of test file maintenance and computer type-setting systems would be an added attraction.

### Rewards

A salary in the range £5400-£6700 will be paid to the Systems Project Leaders, and up to £5000 for Analyst Programmers. There is a contributory pension scheme and free life assurance. The Institution operates flexible working hours, and both posts carry holiday entitlement of 20 days

Relocation expenses are negotiable and assistance with housing on a temporary basis may also be available

Replies should be addressed to John Carmichael, Systems Controller, Institution of Electrical Engineers, Station House, Hinchinbrooke Road, Hinchin, Herts



## SYSTEMS ANALYSIS AT JCB

The growth of JCB has been one of the most significant developments in the earthmoving equipment industry in the 70's and has established an impressive record of growth, investment and export sales.

A review of all group systems requirements is currently underway and a group systems plan will be produced in the New Year. The intention is to replace our existing Burroughs B3500 300kb computer, currently operating in a database, and real time teleprocessing environment, with new hardware which could involve distributive processing. We now seek Analysts to implement and develop our new generation of systems.

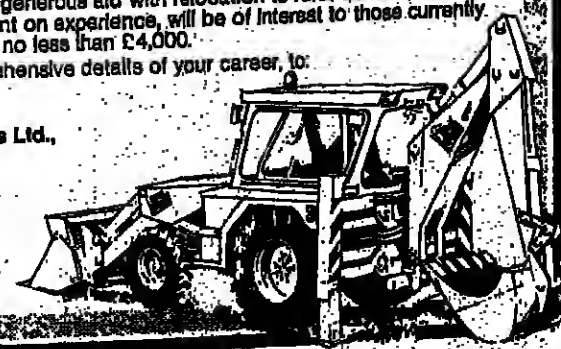
The major areas are:  
the installation and development of real time order processing and stock control systems, probably using a dedicated computer;  
the installation and development of new systems in the financial administration and sales areas of the company;  
the development of real-time manufacturing systems in the shop-floor and material requirements planning areas.

The successful applicant, with experience in any of the above, will be joining a company committed to long-term growth and where prospects are excellent.

As an expanding management services organisation which is not limited to the UK, we offer an attractive package of conditions of employment, an excellent working environment and generous aid with relocation to rural Staffordshire. Salaries offered, dependent on experience, will be of interest to those currently earning up to £5,000 and no less than £4,000.

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Staffordshire,  
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**FURTHER APPOINTMENTS  
APPEAR ON PAGES  
16 and 17**

# The Knight bumper Computer Quiz.

## A case of wine must be won!

As it is Christmas, we thought we'd give you a break from our usual list of contracts (although we still have plenty on our books). Instead, we've devised a little quiz. And we're inviting you, gentle reader, to take part.

When you've found the answers, cut out the whole ad and send it to us. If yours is the first correct set of answers we open, we'll send you a case of wine to the value of £20. If it isn't, we've plenty of consolation prizes. Like a new contract.

## Section 1. Ancient History

1. What and when was Leo?
2. By whom is the computer generally reckoned to have been invented, and when?
3. What was the first application of electronic computers in this country?

Answer

Answer

Answer

## Section 2. Stretch your brainpower

Lateral Thinking Problem.  
A student owed a huge sum of money to a college bully. The bully, lancing the student's girlfriend, proposed a bargain. He told them that he would put a black pebble and a white pebble into an empty pencil-case and then the girl would have to pick out one of the pebbles.

The black pebble would mean that the debt was cancelled and she would become his girlfriend. The white pebble would mean that the debt was cancelled

and she could stay with her boyfriend. They were standing on a pebble-strewn path and as the bully bent down to pick up the pebbles, the girl noticed that he had picked up two black pebbles and put them into the pencil-case. Afraid of pointing out his dishonesty, what should she do?  
Answer

## Section 3. Cunning computations

Working from the left, multiply the third whole number by the fourth decimal.  
0.6, 3, 9, 0.7, 0.1, 0.8, 2, 4, 0.5  
Find the number which completes the series  
7, 9, 40, 74, 1526

Which one of the following numbers does not belong with the others?  
625, 361, 256, 197, 144

Answer

Answer

Answer

## Section 4. Making shapes



a) Underline the odd-man out.

b) Underline the odd-man out.

## Section 5. Keeping a clear head

Follow a series of complex instructions. Work carefully through the information given for each problem.

Do exactly what each sentence tells you to do:

1. If there are five colours in the rainbow ignore the next sentence. Write the first letter of the 11th word in the next sentence in the box. If pigs are pink and giraffes can fly, draw a cross inside the box. Draw a circle inside the box. If you still have not written anything in the box write the sum of the number of days in a week and the number of months in a year in it.

2. If London is a large City and 12-3 is less than 4, write the third letter in the sixth word of this sentence in the box. Write the letter M in the box. If the third day after Sunday is Friday, and there are always 20 days in February ignore the next sentence. If the box is still empty write the second letter of the alphabet in it. If the box is not empty write the initials of Phyllis Plumpley in it.

Easy, wasn't it? Now all you have to do is cut out this whole advertisement and send it to Anne Kingsley at the address below, to arrive not later than January 3rd, 1978.

Name .....

Address .....

Phone .....

I'd really like a case of wine, but I'll settle for a contract instead. Please send me one or the other.



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Contact Margaret Stevens

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Contact Mike Creamer

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Applicants should have at least two years in a field engineering environment. Preference will be given to those with formal qualifications such as ONC in Electronics.

Excellent opportunities to work in a professional organisation.

Contact Margaret Stevens

For further information on any of the above vacancies please contact the appropriate consultant. If your qualifications do not match the above positions but you are seeking other opportunities please contact us anyway.

**JAMES BAKER ASSOCIATES**

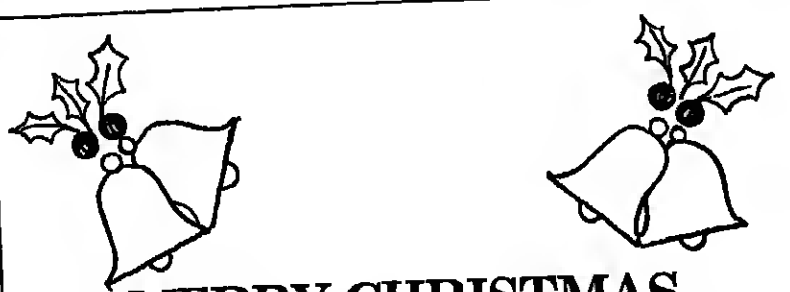
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If you are a programmer, systems analyst, or higher level, with at least three years post-training experience and thinking of emigrating then we can help and advise you. This extends from initial career prospects assessment to acquisition of a suitable and worthwhile position in Australia. In addition we arrange for you to receive a comprehensive information package which will assist in making accurate cost and living standard comparisons in advance; we can also advise on migration procedures and time scales. Great opportunities, salaries, and prospects.

Contact Mike Creamer

**MERRY CHRISTMAS and a prosperous New Year**

We would like to extend our best wishes to everyone for Christmas. In the New Year we wish you happiness, good fortune and success.

Regards from: Jim, Margaret and Mike

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aphona Bill Seymour on 01-549 3212 for further information or direct to dy Ellis in Amsterdam (020) 461844.

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staete, Amsteldijk 166, Amsterdam 1010. Telephone 461844 Telex 11336  
4 Wind Street, Kingston upon Thames, Surrey, England. Telephone 01-549 3212 Telex 27950

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SOCIAL STUDIES**Junior Programmer**

The Data Processing Unit in the Faculty of Social Studies requires a Junior Programmer to join a team of four programmers. The Unit has an I.C.L. link to the University ICL 4.72 computer.

The work is mainly of a statistical nature in the creation and analysis of data bank and preference will be given to applicants with experience of programming in a high-level language and the use of statistical packages. Persons with a university degree will be considered for training.

Salary according to qualifications and experience will be on a scale £2005-£3181 per annum.

Applications giving the names of two referees should be sent by 9th January, 1978, to Miss Doreen Watson, Administrative Assistant (Appointments), University of Exeter, Exeter EX4 4GL. Please quote reference no. 1/36/8447.

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Responsible for systems analysis, design, development, implementation and maintenance activities and liaison with programming, operations and user staff. Previous experience of systems work is essential.

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To assist Systems Analysts as required. Some previous data processing or accounting experience is desirable but training will be given where appropriate.

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**Programmers**

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Applicants are invited to contact Tim Bever, Systems & Programming Manager on 01-573 9045 or write to British Transport Docks Board, Computer Centre, Hayes Road, Southall, Middlesex.

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Your challenge will involve day to day liaison with clients providing consultancy and education support, whilst helping to implement and use financial application packages, this both in the UK and Europe. This role necessitates all candidates having experience of financial applications.

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- EITHER
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CONTACT DAVE SCARLETT, 01-935 0671.

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Applicants should be suitably qualified to lead a team of systems analysts in the Computer Centre at Swinton.

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Post Reference: 1512/DW.

This post is permanent, superannuation and pension rights, the satisfactory completion of a probationary period, and a commensurate salary will be offered. Please send your qualifications. Please write or telephone to the Personnel Manager, City of Salford, 2155 for an application form and details of the post. The number to the Personnel Manager is 0161-724 2200. The Centre, Swinton, M27 2AD, is closed by 30th December.

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£7,000 - £9,000

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For further details, please contact:

Kevin Kelly

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### UNIVERSITY OF BIRMINGHAM Department of Economic and Electrical Engineering

### COMPUTER OFFICER

The University of Birmingham is seeking a Computer Officer to join its Department of Economic and Electrical Engineering. The post involves the operation and maintenance of the University's computer system. The successful candidate will be responsible for the day-to-day running of the system and for the training of staff in its use. The post is full-time and the salary is £3099.28 p.a. (plus £450 p.a. London allowance) which is paid in addition to the basic salary. The post is open to all graduates of the University of Birmingham. Contact Mr G. Dorman for application form 01-837 5411 ext. 419.

## Computer Operator

### International Container Operations

Associated Container Transportation Services is part of a consortium representing five major British shipping companies and provides a wide range of specialist services connected with container shipping throughout the UK and the Continent.

At our Southampton Head Office we currently have a Honeywell 20/60 and a Burroughs 2700 machine and in April next year will be installing a B6700 with an on-line data base communications network.

Due to internal promotion we now require an operator, male or female, with one or two years' experience of Burroughs machines, preferably B6700, to work on a two shift basis: 08.00-16.00 and 16.30-23.30.

Salary will be up to £3464 per annum, depending on experience, plus 12½% shift allowance. Fringe benefits include 45p LVs, four weeks' holiday, contributory pension and personal sickness and accident schemes.

Please write or telephone for an application form to Mrs J. A. Chandler, Assistant Personnel Officer, ACT Services Limited, Richmond House, Tenants Terrace, Southampton. Telephone: Southampton 34433, ext. 3305.



Associated Container Transportation Services Ltd

### Smiths Industries Limited

### Senior Systems Analysts

### Systems Analysts

The Aviation Division of Smiths Industries wish to appoint a number of Senior Systems Analysts and Systems Analysts to work on the new Systems Development Programme at Cranfield.

Essential requirements for these positions are sound knowledge of systems programming plus a record of successful project leadership for the senior posts.

Computer systems play a significant role in the Division's operations, and the main challenge now facing the Management Systems Department is the maintenance of the information system which is the backbone of the Division's complex and rapidly changing business environment.

Applicants should write or telephone for an application form to:

The Personnel Manager,  
SMITHS INDUSTRIES LIMITED  
100, Victoria Road,  
Bishop Cleeve,  
Lichfield,  
Staffs, CV4 9JF.  
Tel: Bishop Cleeve 3333

### SCHOOL EXAMINATIONS DEPARTMENT UNIVERSITY OF LONDON PROGRAMMER

Up to £5,261 inclusive

- \* Six weeks annual leave, plus official Bank Holiday pay
- \* Interest free season ticket loans
- \* Membership of the University's Supermarket Scheme

Applications are invited from programmers with at least eight months' experience in PL/1 and a good working knowledge of COBOL to join a team of programmers responsible for the processing of the University's examination results in U.K. and Overseas. An ICL 1803 computer is used in the U.K. and Overseas. Applicants should be familiar with tape files. Applicants should be familiar with the University's examination systems.

Application forms and further particulars are available from the School Examinations Department, University of London, 66/72 Gower Street, London WC1E 6BT. Tel: 01-630 8903, Ext. 40.

Conference Administrator  
IPC Business & Industrial Training Ltd  
Surrey House  
Thornway Way  
Sutton  
Surrey, SM1 4QQ  
Telephone 01-843 8040

## PROGRAMMERS c £6,250 p.a. LONDON

### MINI SOFTWARE IMPLEMENTATION CUSTOMER SUPPORT IN COMMUNICATIONS YOUNG PERSON WITH CIRCA 3 YEARS' EXPERIENCE

The mini is one of the world's leaders. It is to be used in the form of a very intelligent terminal hooked into a complex mainframe network. Our client requires a bright young Programmer to implement the machine software as a remote batch terminal in a high speed communications environment.

After spending an initial period with the software development team, you will join the technical services division of this world famous manufacturer. In a customer support role, you will be involved in all aspects of software implementation; generation, debugging, trouble shooting, specification of enhancements and liaison with development and user staff.

If you are an Assembler level Programmer with an understanding of communications, here is your opportunity to develop further into this field. Ultimately you could move into one of a wide range of activities from software development through to sales. RW 50/1.

## ASSEMBLER PROGRAMMERS

move into

## SOFTWARE

### OPERATING SYSTEMS, DATACOMMS, UTILITIES

to £6,000 p.a.

Young, well-educated Assembler-level Programmers are needed by one of the world's leading mini computer manufacturers to join their software development team. Working alongside experts you will help create software utilised in thousands of machines worldwide. If you have some Assembler programming experience and wish to move into systems software then ring

DAVID J. HUTCHINSON on 01-499 4501 NOW.

RW50/2

## COMPUTER WEEKLY presents a special one-day conference Solving the computer staff problem

The Cafe Royal, Regent Street, London  
Thursday, January 19th, 1978

### Objectives:

To provide DP Managers and Personnel Officers of firms using computers with an overview of current practice in the recruitment of computer staff.

Shortage of computer staff is a problem which faces all computer users. A lack of qualified personnel is exacerbated by the mobility of computer people and their apparent loyalty to the job rather than the organisation.

In these circumstances recruiting suitable staff poses particular problems. How does the user set out to attract staff? How does he advertise effectively? How does he manage the selection process? Should he use a recruitment agency? Is the use of contract staff a viable solution?

The seminar will seek to answer these questions and to indicate what the computer user should do in order to formulate a successful recruitment policy.

### Session 1

Introduction: The computer scene and computer people. Who are they? What are their characteristics? How are they motivated? Can supply ever catch up with demand?

### Session 2

The user's viewpoint: Finding a way through the recruitment jungle. How can the computer user act effectively to obtain the staff he needs? How should he set about recruiting staff? What are the pitfalls? Planning staff recruitment and development rather than reacting to crises.

### Session 3

The role of the recruitment agency: Identifying 'good' staff requirements. Specifying the post. Drawing the advertisement. Vetting the candidate. Going to the interview. The benefits of specialist knowledge of the job market.

### Session 4

The N.C.C. Job Selection Service: Systems design is a complex task. It requires a specialist skill. The N.C.C. Job Selection Service provides a specialist service to help you find the right person for the job.

### Session 5

How to recruit for computer staff: Recruiting is a complex task. It requires a specialist skill. The N.C.C. Job Selection Service provides a specialist service to help you find the right person for the job.

### Session 6

The DP Manager: Picking the right man for the most responsible job in the computer dept. Fewer in number than other categories of computer staff, DP Managers are worth their weight in gold. The post demands a more generalist, less specialist approach than programming and systems analysis. Spotting those with potential requires a keen eye and a wide ranging knowledge of the business. Filling this key post is a task for a reputable recruitment bureau.

### Session 7

Contract Staff: Increasingly contract staff are being used to overcome work bottlenecks, help in conversion, programmes, etc. as well as compensating for variations in staff availability due to holiday and sickness. Now the use of contract staff is such a well-established feature of the computer scene that it merits inclusion in an overall appraisal of the recruitment problem.

### Session 8

Managing standards in the recruitment function: The CSA has established a recruitment division. What are its aims and objectives? A consideration of the code of conduct. The speakers will include Tony Miller of Futures, John Wood of EMI, George Pinner of the N.C.C., John Goldsmith, Ian Humphries of Knight Computer Services and Neville Smith of O.C.C., Chairman of the CSA Recruitment Division.

Please reserve place(s) at the 'Solving the computer staff problem' conference to be held at the Cafe Royal, London W1, on Thursday, January 19th, 1978. The fee is £55.00 plus 8% VAT (£4.40). Invoice will be sent.

Please send confirmation of booking to (CAPITALS please)

Mr / Mrs / Miss

Company

Address

Telephone

## GCOS TO THE U.S.A.

£11,000 - £18,000 p.a. FULL BENEFITS TRAVEL COSTS

A successful, well established, international software consultancy has openings in PHOENIX, MINNEAPOLIS, NEW YORK and their WASHINGTON D.C. headquarters. These are well-paid permanent jobs working on exciting, state of the art software development projects. Earnings are between £11,000 and £18,000 p.a. plus full fringe benefits and company paid travel to the U.S. Present vacancies are for:

### GCOS SYSTEMS PROGRAMMERS

Reqs: Depth understanding of H6000/Level 66 GCOS. Good GMAP programming experience essential. Preferably able to interpret MM dumps and work with basic I/O.

### TDS and IDS SPECIALISTS

Reqs: Depth understanding of Honeywell TDS and/or IDS. Experience of design and/or support of major database or transaction processing systems.

### COMMUNICATIONS PROGS.

Reqs: Depth understanding of Datanet, GRTS and H6000/Level 66 GCOS. Good experience of design, and/or support of major communications projects.

### PL/1 PROGRAMMERS

In addition two PL/1 Programmers are required. They need good experience on large scale IBM computers and in depth knowledge of design and development of database systems.

Successful applicants will be interviewed in London during December and must be able to move to the U.S. in early 1978.

RW50/3

hutchinson-scoggins recruitment  
10, Dover Street, London W1X 3PH  
Telephone 01-499 4501



# Systems and Programming Staff

## £7000+ benefits

Whilst our range of salaries is £5000 to £9000, the average that we actually pay is £7000.

We're looking for experienced data processing professionals with an ambitious and mature approach to their work.

Please write or telephone for an application form to:

Janet Gothard  
CMG (West End) Ltd  
Sunley House, Bedford Park,  
CROYDON, CRO 2AP  
Tel: 01-688 8251  
(We are re-locating  
to new premises in  
Central London next  
year).

**CMG**  
London · Amsterdam · Frankfurt  
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**ANGLIAN D.P. SERVICES LTD**  
RECRUITMENT SERVICE  
formerly ANGLIAN COMPUTER SERVICES  
**Programmer (RPG11)** Suffolk—£3,800c  
**Senior Programmer (PL1)** E. London—£6,000c  
**Programmer (Cobol)** Essex—£ neg.  
**Analyst Prog. (Cobol)** Essex—£ neg.  
**Programmers (Cobol)** Norfolk—£4,000  
**Business Analyst (Univac)** Essex—£6,000  
Phone: Danbury 4255 (STD 024541)  
or write ANGLIAN D.P. SERVICES LTD.  
Stratford House, Maldon Road  
Danbury, Chelmsford CM3 4QW

**TO £5.2K SYSTEMS ANALYST**  
Our client requires a commercial analyst with a programming background and good academic qualifications, capable of communicating easily with users throughout the group. (IBM 370)  
**TO £5K ANALYST/PROGRAMMER** Luton  
A good COBOL background is essential for the development and maintenance of corporate packages on our client company's IBM 370 operating under OOS/VS.  
**£5.5K TEAM LEADER** London  
A programming team leader is required to organise and supervise the work of the team. This is an IBM COBOL installation also using OL/1. Knowledge of BAL would be useful.  
**COMPUTER SYSTEMS & PERSONNEL**  
168 Finchley Road, London NW3 8HP

## Systems Analyst/Programmer

### International Security Printing Company

£4700-£5600

This new appointment arises from the proposed extension of the services provided by our ICL 2903 installation.

Reporting to the Data Processing Manager, the person appointed will be required to lead and successfully complete a programme of projects to improve and develop the data processing systems and services within the Company. A good educational background and a minimum of two years' experience of systems analysis is required.

Actual starting salary will depend on individual qualities and experience, and will be supported by a substantial range of fringe benefits.

Please write or phone for an application form to:



The Personnel Officer  
Bradbury Wilkinson & Company Limited  
265 Burlington Road  
New Malden  
Surrey KT3 4NH  
Tel: 01-947 3271

## MERRY CHRISTMAS

The Classified Advertising Department of Computer Weekly would like to wish all their friends and advertisers in the computer industry a very merry Christmas and a happy and prosperous New Year.

## EDITORIAL STAFF

We require an editor and other editorial staff for the fortnightly

## PACIFIC COMPUTER WEEKLY

the only computer newspaper circulating in Australia and New Zealand  
Location: either Melbourne, either still Melbourne and Sydney.

Send full details of experience, marital status together with a recent photograph and complete curriculum vitae to —

Managing Director  
Peter Ikenocean Publications  
PO Box 172, Prehn  
Victoria 3181, Australia

## The International Atomic Energy Agency, Vienna, Austria

seeks for its Computer Section (IBM 370/158, MVS)

## APPLICATIONS PROGRAMMER/ANALYST INFORMATION SYSTEMS

for systems analysis and programming in information management and retrieval applications. Experience with PL/1 on IBM 360/370 OS required. Experience in teleprocessing systems an advantage. This post requires a strong interest in information systems.

Five years' relevant experience in programming and a high level of education are required. Tax-free emoluments in the region of £7,600 to £8,600 p.a., depending on experience and qualifications, travel and removal expenses paid. Resident's allowance, installation grant, etc. dependent on dependency allowance.

Send curriculum vitae to Division of Personnel, Atomic Energy Agency, P.O. Box 550, A-1100 Vienna, not later than ten days from today.

## Rediffusion at Aylesbury Programming Manager

We have a large ICL installation — 1803A plus 1801T plus 32 key to disc stations, etc. — in a modern purpose-built computer block in the centre of the Chiltern Country. We need a Programming Manager to help plan a number of interesting future developments. He, or she, will have a minimum of four years' actual experience, preferably including plan. He or she will be well able to apply project control techniques and be prepared to reinforce our existing programme standards.

An appropriate salary, with the usual fringe benefits, will be paid and if necessary help will be given with removal expenses.

Please write briefly to: R. H. Brazier, Data Processing Manager, Rediffusion Central Services Limited, PO Box 60, Rediffusion House, Gatehouse Road, Aylesbury, Bucks. HP19 3DU

**REDIFFUSION**

# MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

## PROGRAMMERS New Computer

BERKS.

£5,500

Are you seeking a positive career move within a new machine environment? Our Client, an internationally recognised leader in their industry, are seeking capable Programmers with at least 2 years' experience, gained in a mainframe environment. The Company offers excellent working conditions, with the possibility of European Travel at the more senior Programmer levels. Career progression opportunities are very good and applicants can expect rewards commensurate with experience and responsibility. The Company has an agreed Systems Plan which will present new team members with interesting development projects during the coming years.

## ANALYST/PROGRAMMER PROGRAMMERS

C. LONDON

To £6,000

Additional personnel are being sought for development projects within a well-established company. PROGRAMMERS should have a minimum of twelve months' COBOL. Successful candidates will have at least 2-3 years' COBOL will be appointed at a more senior level. The ANALYST/PROGRAMMER will have sound COBOL experience and preferably will have had some degree of design and/or analysis involvement. Particular machine experience is not important. Previous involvement with financial, manufacturing or personnel applications would be relevant. There are definite opportunities for first-rate applicants to gain future progression to analysis or supervisory positions. A realistic salary and generous fringe benefits will be offered to those appointed.

## PROGRAMMING CONSULTANT 3-4 YEARS' IBM COBOL

WEST LONDON

To £7,500

We are seeking a Programmer or Analyst/Programmer keen to accelerate his/her career by a move to Team Leading. You will be expected to play a major role in the development and implementation of financial projects from specification through to overall testing. The person appointed will have in depth knowledge of COBOL with an appreciation of DOS/VS issues. Previous supervisory experience is not essential although a commitment to maintaining high standards of coding and documentation is required. The Company, a subsidiary of a major Banking concern, offers a friendly environment with exciting prospects for career development. The offices are conveniently situated to both underground and main-line stations.

## SYSTEMS ANALYST DEPUTY D.P.M.

LONDON

£5,500

An experienced Analyst is required to join a small data processing department based in London convenient for commuters using the London Bridge/Cannon Street train services. The person appointed will be able to control programming teams and will therefore have the necessary technical background together with proven analysis skills. The department is small and dedicated to giving a professional data processing service to the company. The installation is based on Burroughs medium range hardware, current projects include the development of database systems. This is an excellent opportunity for an experienced computer person to combine their expertise and develop their career in a junior management role.

Please telephone for a confidential discussion or write to:  
30 Fleet Street London EC4Y 1AA  
01-353 0981

## datascene

## SENIOR FORTRAN PROGRAMMERS

£5,000 - £7,000

Our client has a holiday home in the heart of the Christmas spirit, it's time to think about a new job. The job is with a business based in the Midlands and South East. A background in business and computer systems is essential. As a Senior Programmer, you will be involved with a lot of client contact. Generous expenses are available.

This is just one of the jobs we're looking for this Christmas. So before you get really stuck into the Christmas spirit, stagger over to the telephone.

Ring Sally Dicken today!  
Datascene Limited  
Sceptre House  
169-173 Regent Street, London W1R 7FB

01-439 7871

24-hour answering service

## datascene

## MINI-PROGRAMMERS LAPLAND ONE-SHIFT CONTRACT

Our client is an internationally recognised institution, heavily involved in the distribution of consumer durables. The years' planning activities in a one-way system during which our client and his representatives have to be simultaneously present at a wide range of locations. With an intense sense of humour, applicants should also possess a wide knowledge of programming and be able to work in an atmosphere of heavy laughter and the occasional switch of song. The hardware used is a Real 77, operated under JOLLY and HOMO. An additional familiarity with TROJAN is to be encouraged. The salary is attractive, but benefits include a pension and hot and cold meals plus a travel supply of beer. The shift commences on the evening of December 24th. This vacancy is exceptional. However, you have others handy last Saturday for Mini-Programmers, in all areas, at salaries ranging from £3,750 to £6,800.

Ring Sally Dicken today!  
Datascene Limited  
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## PROGRAMMERS WHO WANT TO BE ANALYSTS to £4,000 p.a.

This is the ideal time to start the old cliché 'New Year, New Job'. Because this vacancy — with the Computing Services Division of a major transport and storage company — is for a Programmer who will become an Analyst/Programmer during 1978. The hardware used is an ICL 1902A under GEORGE II, with a Communications system currently being developed. The main language is COBOL, but an additional knowledge of PL/I would be helpful. You should have around 12-18 months' solid experience on other IBM or ICL equipment. The Department is small but busy, situated near London Bridge, and perks include 4 weeks' holiday, 25p a day VLE and free pension scheme. We have many other vacancies for Programmers at all levels, from January on. So, before the turkey and put get to you, Ring Phil Goodridge today!

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AREA	LOCATION	START DATE	END DATE	WEEKLY RATE
DATA	W. LONDON	1/1/78	31/12/78	£3500
DATA	W. LONDON	1/1/78	31/12/78	£3500
DATA	W. LONDON	1/1/78	31/12/78	£3500
DATA	W. LONDON	1/1/78	31/12/78	£3500
DATA	W. LONDON	1/1/78	31/12/78	£3500

## SENIOR OPS/MANAGERS

AREA	LOCATION	START DATE	END DATE	WEEKLY RATE
DATA	W. LONDON	1/1/78	31/12/78	£4500
DATA	W. LONDON	1/1/78	31/12/78	£4500
DATA	W. LONDON	1/1/78	31/12/78	£4500
DATA	W. LONDON	1/1/78	31/12/78	£4500
DATA	W. LONDON	1/1/78	31/12/78	£4500

AND MANY, MANY, MORE!







# measurex

(IRELAND) LIMITED

A leading manufacturer of digital computer integrated measurement and control systems, continues to expand its operations in Ireland. Measurex manufactures its systems for the European market in a facility located in Waterford, Ireland. In order to further serve the needs of this market and broaden the base of its Irish operations, an expanded Engineering Group has been established and will be located in Cork, Ireland. The Group's responsibilities will be as follows:

Manufacture of all computer software and control products across Measurex's product line in the Paper, Pulp, Energy Management, Rubber, Plastics, and Metal Industries. Support of the introduction of new products into the European market. Implementation of product enhancements in co-ordination with California-based Measurex Corporate Engineering Department.

The following job opportunities exist:-

## SENIOR CONTROL ENGINEERS

Salary up to £9,500 per annum

### DUTIES:

To work initially as a member of an engineering team involved in specification, planning, implementation and commissioning of computer-based digital measurement and control systems for the Pulp and Paper Industries in Europe.

Advancement possibilities to Project Leader with suitable qualifications and experience. Job will focus on control/applications knowledge as implemented in Software for industrial control systems. The successful candidate will hold a good Engineering or Science degree in a relevant discipline with several years varied experience of the analysis and control of industrial processes, preferably in the Pulp and Paper Industries. Experience in the use of digital computers is highly desirable. Travel throughout Europe will be required.

## CONTROL ENGINEERS

Salary up to £7,000 p.a.

### DUTIES:

To work as a member of an engineering team involved in specification planning and commissioning of computer-based digital measurement and control systems for industrial processes. The successful candidate will hold a good Engineering or Science degree in a relevant discipline. One to four years experience in the field of process control in the Paper, Rubber, Plastics or Metals Industries desirable. Experience in the use of digital computers is highly desirable. Travel throughout Europe will be required.

## SOFTWARE ENGINEERS

Salary up to £7,000 p.a.

### DUTIES:

To work on the development and manufacturing of computer-based digital measurement and control systems in the Paper, Rubber, Plastics or Metal industries. To be involved in the installation and start-up phases of these systems. The successful candidate will hold a good Engineering or Science degree with course work in Digital Computing and Computer Programming. Experience in assembly level programming of Real-Time Computer systems is highly desirable. Travel throughout Europe will be required.

## SOFTWARE TECHNICIANS

Salary up to £4,000 p.a.

### DUTIES:

To work under the direction of a Software Engineer in the building, assembly, and testing of the software associated with computer-based digital control systems. The successful candidate will have completed secondary education and had some exposure to digital computers and some knowledge of computer programming; of key importance is an alert mind and a willingness to learn.

There is a contributory pension scheme and a bonus scheme. Relocation allowances will be payable if appropriate.

Reply in confidence to: Colin McNaught, Engineering Manager, Measurex (Ireland) Ltd., Industrial Estate, Waterford. Telephone 051-32151

University College Hospital

## Systems/Designer Programmer

There is a vacancy in the Pathology Department for a Systems Designer/Programmer to work on the further development and expansion of a data management and on-line data acquisition system.

The system is being developed on a Modular One computer with disc backing store and multiple terminals. The job offers considerable scope for experience in design, programming and implementing a computer system in a real time environment. The successful applicant will be expected to adopt a disciplined professional approach, and must be used to working to time schedules.

Applicants should have at least 2 years' experience in computing. A knowledge of Modular One, Corel 66, or Medical Computing would also be advantageous.

Salary within range £4,400 to £5,210 inclusive. Application forms and further information can be obtained from the Personnel Department, University College Hospital, Gower Street WC1E 6AU. Tel: 01-387 8300 Ext. 381 quoting ref: CW/SDP/SP. Closing date 30th December.

## LIVERPOOL AREA PROGRAMMERS to £4,500

### We require

- 18 months' COBOL experience in a commercial environment

### We offer

- A challenging career with an expanding company
- Work on the latest hardware on a variety of projects from design to installation
- Development to analyst duties for right people.

Write or telephone 051-427 311

BCT Systems

80-82 St Mary's Road, Garsion, Liverpool

## UNIST

UNIVERSITY OF WALES  
UNIVERSITY COLLEGE  
OF SWANSEA

Applicants are invited for two vacancies in the Computer Centre

### Shift Leader

The Shift Leader is responsible for the work of team operating an ICL 1902S with extensive links to other units and other computer centres on a 24-hour, 7 days a week, shift basis. Applicants should have a minimum of two years' experience in the field of process control in the Paper, Rubber, Plastics or Metals Industries desirable. Experience in the use of digital computers is highly desirable. Travel throughout Europe will be required.

### Senior Computer Operator

The Senior Computer Operator will work under the direction of a Shift Leader on the ICL 1902S. Applicants should have a minimum of two years' experience in the field of process control in the Paper, Rubber, Plastics or Metals Industries desirable. Experience in the use of digital computers is highly desirable. Travel throughout Europe will be required.

Shift Leader £3,000-£3,500  
Senior Computer Operator £2,800-£3,400 p.a. annum

Further particulars and application forms (two copies) may be obtained from the Personnel Office, University College of Swansea, Singleton Park, Swansea, SA2 8PP, to whom they should be returned by Friday, January 30th, 1978.

**LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE**  
(University of London)  
Keppel Street, WC1E 7HT

### ASSISTANT SUPERVISOR

(COMPUTER TERMINAL)

This post carries responsibility for the day-to-day management of an RJE (Remote Job Entry) terminal. The successful candidate will be expected to adopt a disciplined professional approach, and must be used to working to time schedules.

Applicants should have at least 2 years' experience in computing. A knowledge of Modular One, Corel 66, or Medical Computing would also be advantageous.

## LEEDS Programmers

Progression to Analysis

c. £4500

Looking for an above-average opening in an above average company? This opportunity offers:

- the chance to learn database, real-time and communications techniques
- applications programming in COBOL and CORAL
- plenty of development work
- good career prospects in a major international marketing and manufacturing group

On behalf of our clients, we are looking for ambitious programmers with:

- upwards of 1½ years' practical experience ON ANY MACHINE in a commercial environment
- a good educational background and a high degree of self motivation
- the aptitude to develop into systems analysis in due course, with appropriate training

Relocation assistance will be given where applicable. Initial interviews will be held in Leeds or London, whichever is the more convenient for you.

If this excellent career opening appeals to you, please ring us in complete confidence, or write briefly, quoting ref. 818. Messages will be recorded after hours.

Tel: 01-637 5796

**EDP Systems**  
52-53 Margaret Street  
London W1N 7FF

## CAREER LAUNCH!

PROGRAMMER/ANALYST-PROJ. LEADER  
£7,000 p.a.

Fast growing, energetic young company (part of an established multi-million £ UK organisation) with training opportunities in the London area (already well established in other parts of the UK). Rapidly expanding to meet increasing demand for management potential to meet the growing demands that increased business is making. Take this opportunity to jump from the level of an analyst to the level of a programmer. If you have 3-5 years' experience with a programming background (preferably COBOL) in addition to applications then don't delay - call now Ref. CS 1089.

00 EXECUTIVE (KINOSTON) 01-546 9473

## MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

## PERFORMANCE MEASUREMENT

NEAR READING

£6000-£8500

A key department within our client's organisation comprises an elite team specialising in Performance Measurement and the Comparative Evaluation of various hardware and software products offered by major manufacturers.

The department is presently being expanded and a number of additional staff are required who have experience in carrying out benchmarking exercises using hardware monitors and other sophisticated techniques. In addition to organising system performance trials the positions call for a high degree of individual flair and initiative in reacting to findings to ensure optimum results are achieved in competitive situations.

Whilst candidates should bring expertise in any area of hardware or software performance measurement, specialist knowledge in any one of the following would be of particular interest:-

- ICL 1900/2800 under GEORGE/Systems 9 or K
- Univac 1100 under EXEC-8
- Honeywell Series 60/84-80/88
- Gurroughs 6700/800 series

The successful candidate will have the opportunity of broadening their horizons to a wide range of products and keeping abreast with the latest hardware and software available.

The Company has substantial interests throughout the world and provides its employees with extremely good conditions of employment and considerable scope for career advancement.

Please telephone for a confidential discussion or write to:  
30 Fleet Street, London EC4A 3AA

## MERRY XMAS AND

Operators  
Nr. Hounslow  
To £4,000 inc.

Several vacancies exist for manual three shift working for ICL ODP people. Candidates must have 10% experience, etc. Nice company CW80/1, Patricia.

Operator  
N. London  
To £3,800 inc.

If you have large IBM experience apply now. DS HASP would be ideal. Lots of work including four weeks full time three shift system. CW80/2, Patricia.

Operator  
Nr. Maidstone  
c. £4,000

A hands-on high speed separation requires an operator with sound IBM DS/VS experience. A company discounts etc. two shift system CW 80/3, Patricia.

Two Senior Analysts  
City  
£6,500 to £8,000

You must have five years' experience and be a really competent commercial IBM systems analyst. It would be nice to have COBOL, DOS as part of your background and the ability to manage large systems. Challenging position. CW80/5, Annette.

Systems Analyst  
Sierra Leone  
£10K

An exciting opportunity for minimum one year in WEST AFRICA for an analyst with 1 or 2 years systems experience. It is essential that the applicant also has O & M in their background and an additional plus is knowing the IBM System/3. Simple people would be preferred. A house servant will be provided. CW80/6, Annette.

## New Sales Support & Sales Posts-UK

A major international computer company, based in Europe, are seeking a proven range of small computers in the New Year. They therefore immediately require experienced Systems Analysts, Salesmen and Technical Support Personnel as well as UK Training Officers. Previous experience should be with RPGII type computers or mainframe computers using commercial skills with a professional approach to problem solving. Personnel will have a marvellous opportunity to get in on the ground floor where salaries will be very competitive. Vacancies exist in W. LONDON, BIRMINGHAM, MANCHESTER and LEEDS CW80/4, Michael.

Programmers  
Hemel Hempstead  
c. £5,000

Are there any of you who have commercial FORTRAN? Good then this multinational firm in Herts. with top posts including free lunches and non C.P.S. is looking for your. Your experience would be ideal but other machines acceptable CW80/7, Annette.

Senior Programmer  
SW1  
to £7,500

A very successful commercial service bureau, having an IBM DOS computer, needs an experienced COBOL programmer with more than the mortgage ability. Must enjoy meeting and advising clients. LV's C.P.S. etc. CW80/8.



DATA EXPRESS HOUSE  
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HEATHFIELD TERRACE  
CHISWICK W4 3BR

Recruitment Consultants

01-995 3883 or  
01-958 6138 evenings

## WILL YOU HAVE A SERIES/1 IN YOUR CHRISTMAS STOCKING?

Programmers with Assembler experience are required to join **Altergo**. These vacancies offer unrivalled opportunities for programmers to work on some of the first Series/1 application projects in Europe.

The right people will join the strongest team of computing specialists in the country, where a constant interchange of ideas and experience create a stimulating working environment.

**Altergo** offer all the benefits befitting a successful and dynamic company including a high salary, expenses, overtime, bonus scheme and overseas opportunities.

Give yourself a Christmas present, contact:

Brian Walker  
**altergo**  
Warwick House  
25 Abchurch Lane  
London EC4A 3DF  
Telephone: 01-734 8851

## SYSTEM CONSULTANT LONDON

## SOPHISTICATED COMMERCIAL SYSTEMS to £7,000

Our Clients have enjoyed substantial success in the UK and Europe this year based on market-leading, packaged software.

To prepare for 1978 and continued growth, they wish to identify TWO JUNIOR CONSULTANTS in key positions in a prime area of the group. The challenge to the successful candidates will involve day-to-day liaison with clients, providing consultancy and education support, whilst helping to implement and use Payroll and related Applications Packages.

Essentially you will possess:

- A relevant commercial background
- Systems experience, ideally coupled with a programming background, gained in either an IBM or ICL environment.

As you will provide front line support to major customers at all levels, a professional attitude, presentability, and effective communication are essential qualities.

This is an excellent opportunity to gain creative business experience in a competitive, rewarding environment.

CONTACT: GAVIN SCARLETT 01-935 0671 CW/12/10

### SPECIALIST COMPUTER RECRUITMENT LTD.

BIRMINGHAM 021-236 3781 FREEPOST  
Freeport, Equity and Law House, 35-37 Great Charles Street Queensway, Birmingham B3 2BR

MANCHESTER 061-833 0676 FREEPOST  
Freeport, Corn Exchange Buildings, Corporation Street, Manchester M4 8BD

LONDON 01-935 0671 FREEPOST 6

Freeport 6, 102, Blandford Street, London W1E 1JZ

Computing  
Services  
Association



The Polytechnic  
of North London

LONDON  
POLYTECHNIC  
COMPUTER UNIT  
Analyst  
Programmer

Opportunity for person with knowledge of COBOL to join successful computer unit. We require a versatile programmer to take charge of the student records system and other administrative projects. The post offers scope for experience with programming systems analysis or systems programming.

### Systems Programmer

Experienced programmer to join a team doing software maintenance and enhancement, user support, application programming, hardware and software evaluation, and documentation. A degree or professional qualification is required. Familiarity with IBM or Dec-10 and experience with microprocessors would be an advantage.

The hardware ICL 1902 (RISC), soon to be replaced by a new machine; full range of peripherals, plus access to a Dec-10.

The salary both posts are on a scale from £5,000 to £8,000 (including up to £2,000 bonus) depending on qualifications and experience.

Further details and application form from the Head of POLYTECHNIC, Polytechnic of North London, Holloway N7 8DB. (01-278, ext. 228).

**THE UNIVERSITY OF LANCASTER**

RESEARCH ASSISTANT  
DEPARTMENT OF COMPUTER STUDIES

Applicants are invited for the post of RESEARCH ASSISTANT in the Department of Computer Studies. The successful candidate will be involved in developing and supervising activities for the Department. The post is a full-time position. Experience of an applicant would be advantageous.

The salary and benefits are on a scale of £5,000 to £8,000 (including up to £2,000 bonus) depending on qualifications and experience.

Further details and application form from the Head of POLYTECHNIC, Polytechnic of North London, Holloway N7 8DB. (01-278, ext. 228).

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## ... A HAPPY NEW JOB!

Time Sharing  
Programmers to £6,000

C. LONDON

If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre- or post-sales support. Some offer generous bonus schemes CW 80/12, Michael.

Systems Consultants  
£6,000-£9,500

CENTRAL LONDON

Seven large well established consultancies wish to recruit systems people with all-round experience on third generation equipment and the right personality to deal with clients who require first rate service. Technical communication consultants are also required where in-depth implementation experience at IBM or ICL T/P message switching networks etc. are essential. Excellent fringe benefits and prospects. CW 80/10, Michael.

Mini Computer  
Programmers to £5,950

U.K.

Your experience is required now. A very large number of vacancies are registered where a knowledge of COBOL, BASIC or FORTRAN is essential. (VCR programmers would also be considered). Opportunities exist in S.W., N.W. or E. London, Surrey, Herts and Manchester in this exciting and rewarding field. There has also been registered some overseas posts to people with 5 or more years in mini computers. CW 80/11, Michael.

**WEA**

DATA EXPRESS HOUSE  
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CHISWICK W4 3BR

Recruitment Consultants

01-995 3883 or

01-958 6138 evenings

RPG II Programmers  
£4,000-£6,500 +

LONDON & H. COUNTIES

We now have eight commercial companies who have vacancies for RPG II programmers and Analyst Programmers. Jobs exist in C. London, W. London, Middlesex, High Wycombe, Crawdon and Dorset. Most firms offer LV's. 4 weeks holiday. etc. CW 80/15, Patricia.

Operators to Shift  
Leaders  
£2,000-£4,000 (incl.)

LONDON & HOME COUNTIES

We have many vacancies covering all types of machines and locations. Some firms will train new recruits. Others will require previous experience. CW 80/16, Michael.

Technical Authors  
W. London & Herts.  
£5,000

Four manufacturing companies are looking for competent technical writers with min or maintenance experience. CW 80/14, Michael.

Successful Salesmen  
to £12K quota earnings

U.K.

We now have ten different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. They must have previous relevant small systems experience (some VCR's will be considered). All firms have bonus schemes and car or car allowance. Most positions in B.E. England, but 2 in Midlands. CW 80/18, Michael.

Contract Programmers  
to £240 p.w.

U.K.

Immediate requirements for IBM, RPG II IBM COBOL under DOS or OS for C. London, PL/1, OS or CICS, FORTRAN or good BASIC for various locations for three months plus. Also IBM vacancies in Europe. Ask for the Contracts Officer at 01-935 0671.

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## MYRIAD OPERATIONS

Computer Personnel Consultants

Myriad would like to hear from OPERATIONS PERSONNEL seeking a career move in London or the Home Counties. Telephone our Operations Consultant for a confidential discussion, whether or not you see the job you want listed below. We will not release your details to any organisation without your consent.

### SHIFT LEADER DOS/VS, POWER

Supervisory experience and self-motivation are important.  
E.C.3 To £4750

### BURROUGHS

Operator, min. 18 mths. MCP. Service bureau — offers good prospects.  
E.C.2 To £4500

### SENIOR OPERATOR

Three shifts. 2 years' DOS/VS experience. Ambition and enthusiasm are called for.  
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No shifts. International manufacturing organisation. Ability to work alone.  
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### OS OPERATORS

Insurance company, new machine, recently installed. 1½ shifts at present.  
City £3900

### OPERATORS DOS/VS

City, Middlesex, Surrey, S. East and West London. Lots of opportunities if you have nine months' plus experience.

Please telephone for a confidential discussion or write to:  
301 Leet Street, London EC4Y 1AA  
01-353 0981

## Glaxo Holdings Limited

## Operations Manager c £7,500

Glaxo Holdings is the parent company of a leading international group, with a turnover exceeding £400 million, which conducts research and develops, manufactures and markets a range of pharmaceuticals, foods and surgical equipment.

The Group Computer Centre provides a batch and on-line financial and management information service to the executive directors and senior management of the parent company and in addition offers a remote job entry facility to one of the major manufacturing subsidiaries, using a newly installed ICL 1903T 128K operating under George 2+. Data preparation work is performed on Kude Datavet equipment.

A vacancy has now arisen for an Operations Manager to take control of the operations section, comprising a total of 16 people. It is anticipated that the man or woman appointed will be aged between 27-35, possibly a graduate, with at least 5 years' significant experience in computing including a minimum of 2 years in an operations management capacity, preferably in a 1900 environment.

This is a senior appointment reporting directly to the Data Processing Manager. Total first year income will be in the region of £7,500, including both London allowance and bonus. The Company offers an excellent conditions of employment package and assistance with re-location expenses will be given where appropriate.

Please write, giving brief career details, to: P. A. Drew, Glaxo Holdings Limited, Clarges House, 6-12 Clarges Street, London W1Y 8DH.

### TECHNICAL OPERATIONS MANAGER

£5500 - £8500 p.a. plus car

As a result of our continuing expansion in the United Kingdom, we require an experienced Computer Professional to assist us in the development of our computerisation programme.

The Technical Operations Manager will manage the operation of an existing installation using a mini computer and assist with the implementation of new applications involving the introduction of a second installation during 1978. He/she will be responsible for the management of both installations and should be prepared to work flexible hours to approximately 8 p.m. (and occasionally later) Tuesday to Saturday.

The successful applicant, who is likely to be aged 25-35, must have a knowledge of R.P.G. or other high level language. Previous experience of installing a mini computer would be an advantage.

Conditions of employment are those normally associated with a progressive international Company and include a Company car, pension scheme, subsidised canteen and special facilities for car purchase.

Handwritten applications should be addressed to —

Mr. K.R. Broome,  
Administration and Personnel Manager,  
Citroen Cars Ltd.,  
Mill Street, Slough, Berkshire.

CITROËN

## POLYSAR

Polysar International SA is the Overseas Sales Organisation for a Canadian owned international Group engaged in the manufacture and sales of synthetic rubber, latexes and plastics, established in Fribourg, Switzerland since 1962. We have an interesting opening in our EDP Department for an

### ANALYST/PROGRAMMER

Applicants should be graduates in Economics/Finance or associated disciplines who have proven experience in a commercial organisation. At least two years' EDP background with some exposure in the analysis field. Ideally involving international operations, as well as strong programming ability with emphasis on COBOL end/or RPG-II are essential requirements for this position. Linguistic knowledge should include fluency in English and French.

The successful candidate will be entrusted with varied and interesting work assignments. A certain amount of his time will be spent outside Switzerland. We offer fair remuneration commensurate with qualification and experience, and social benefits expected from a progressive Company.

If you are interested in this opening please send your resume to:

The Assistant Personnel Manager  
Polysar International S.A.  
10, Rue de Beaumont  
CH-1701 Fribourg/Switzerland

### CAREER OPPORTUNITY IN COMPUTER ANALYSIS AND PROGRAMMING

The bank for international settlements, an international institution situated in Basel, Switzerland, has a vacancy for an Analyst/Programmer in its Technical Services Section.

Requirements: a minimum of 5 years' experience implementing applications of a banking or accounting nature in support of on-line systems, preferably in PL/I and Assembler. A good command of English is required as well as a sound working knowledge of French or German. The successful candidate will be employed initially in the Accounting Section for a period of about 18 months and will later assist in programming the bank's on-line systems. He or she might eventually be appointed supervisor of the application programming team.

The BIS offers interesting and challenging work, a competitive starting salary and substantial staff benefits, such as first-class pension and welfare schemes, a staff restaurant and a sports club.

A detailed curriculum vitae, accompanied by references and a recent photograph, should be submitted to Mr. S. Hillbert, Sub-Manager, Personnel, Bank for International Settlements, P.O. Box 262, CH-4000 Basel, Switzerland. Applications will be treated in strict confidence.

### FALMER JEANS LIMITED

require a

## DATA PROCESSING MANAGER

We have recently ordered a B.1800 computer system to be installed at our distribution and administration centre in Essex. We are fast expanding and operate from several locations in the U.K. and Europe.

The position offers an outstanding opportunity to a person wishing to progress in management and play a central role in the development of a new and advanced system.

The salary is negotiable, dependent on age and experience and will be in the range £5,000 to £8,000 per annum.

Please write with full details of age, qualifications, experience and current salary, to:

Mr. K. Wright  
Falmer Jeans Limited  
Clevedon Lane  
Reyleigh, Essex

FALMERS

## RACS

### SYSTEMS ANALYST

c £5100

### PROGRAMMER/PROJECT LEADERS

c £4000-£4900

Applications are invited from persons with the relevant commercial, programming and analytical experience to join a development team engaged on a number of challenging projects.

The institution comprises an IBM 370/145 running under DOS/VS and CICS/VS, and in addition an on-line system using 3270s, we have a retail system with point of sale terminals and other remote terminals.

Please write giving brief details of experience and age to:

Financial Controller  
Royal Arsenal Co-operative Society Ltd.  
147 Powis Street, Woolwich, London SE18 6JN  
or telephone: 01-854 2000 Ext. 418

### LONDON BOROUGH OF ENFIELD

### Systems Analyst/ Programmer

£4,161-£4,507

Applications are invited for this appointment in the Computer Section of the Borough Treasurer's Department. Candidates should be experienced COBOL Programmers, preferably with systems training or experience.

The Borough's computer installation currently consists of a 04K ICL 1902T and planned expansion includes 7502 terminal systems.

An application form is obtainable, upon receipt of a feeless S.A.C. from the Borough Treasurer, P.O. Box 64, Civic Centre, Silver Street, Enfield, EN1 3XF. Closing date 6th January, 1978. Please quote reference ORA/55.

### MEDICAL RESEARCH COUNCIL Institute of Hearing Research University of Nottingham

### SYSTEMS PROGRAMMER

This is a responsible post in a new and expanding research unit which will provide a valuable experience for the successful candidate. The Institute will have a postgraduate qualification in Computer Science and some experience of both data base management and real-time data acquisition. The Institute will be purchasing a powerful central system for medical research and for the high data rate analysis and synthesis of speech signals. The successful applicant will be expected to assist in the selection of a powerful 10-bit computer configuration and in evaluating suppliers' data base management systems. Writing interfaces to and from the computer will form a major part of the duties.

Recent applicants should be normally appointed initially to the Institute of Hearing Research, 101, Clarendon Road, Nottingham NG7 2RN, to whom applications should be sent by 15th January, 1978. The post will be filled as soon thereafter as the need arises.

## DATA PROCESSING MANAGER NORTHANTS SALARY c£5,000 P.A. "MAKE 1978 YOUR YEAR"

Our client, a market leader in its field, currently operating a new IBM system 3 mainframe, wish to recruit a computer professional with a programming and systems background to head the Data Processing Department.

Ideally, candidates should be aged between 25 and 40 and should have:

- \* RPG II and/or COBOL programming experience, combined with some knowledge of systems.
- \* the personal qualities needed to liaise with senior members of the company.
- \* the desire to progress into a management role.

The company are engaged in active systems development plans to include: Budgetary planning (corporate modelling)/Product Analysis (wholesale and retailing)/Personnel Data/Coatings (factory products)/Retail Management information system.

The position would appeal to a data processing professional, capable of accepting a stimulating challenge.

Normal large company benefits apply and include: extensive discounts on company products, a contributory pension scheme, four weeks' holiday, free BUPA and assistance with relocation.

If you feel you have the experience and personal qualities needed to accept a management role, contact without delay:

REG HEATH

DN: 021-236 3781

REF. NO. CW/12/89

### SPECIALIST COMPUTER RECRUITMENT LTD.

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# SCR

## SENIOR SHIFT COMPUTER OPERATOR Hinckley

British Gas has a network of real-time computers which is used to monitor and control the National Gas Transmission Grid. A vacancy exists for a Senior Shift Computer Operator to complete a team providing continuous operational support of the machines.

Applicants should have at least 2 years' operating experience, preferably on large real-time systems. Four 'O' levels or equivalent qualifications are normally required but the ability to think clearly, sometimes under pressure and to work unsupervised on varying workloads, could be more important.

This is a responsible job on a system of considerable technical interest. Housing in the immediate area is very reasonably priced; the cities of Leicester, Coventry, Nottingham and Birmingham are within easy reach. Working conditions are excellent with good opportunities for leisure activities outside working hours.

Salary is from £3900-£4874, inclusive of 26% shift allowance and salary supplements.

For further preliminary details telephone Mr. G. P. Brown on (0535) 38111 Ext. 2173

Please quote reference PS/08001 (705)

BRITISH GAS

### Portsmouth Highbury Technical College

### Programmer/Analyst

A new ICL 2903 has recently been installed and will provide a computing facility for use by all the departments of the College.

The successful applicant, to commence January, 1978, will be required to provide a programming and advisory service for the development of applications and systems software.

Applicants should be of graduate or equivalent educational standard and preferably have had at least one year's programming experience in COBOL and/or FORTRAN or ALGOL.

Salary: £3,395 to £3,773 for AP 3 and £3,861 to £4,214 for AP 4.

Application Forms from The Secretary, Highbury Technical College, Portsmouth PO6 2SA (enclose SAE) or Cosham 63131 (Ext. 2477).

## CONTRACTS MANAGER

Croydon Based

With the growth and success of our contract division, for a B Computer Services, require an additional member of staff to concentrate exclusively on the negotiation of contracts with clients and the placement of contract staff.

The person required may be a Senior Programmer or already established in this kind of job. You must be outgoing, interested in people and now wanting to develop your career.

Please telephone 01-680 3761 for further details or write enclosing a C.V. to: Hutton Computer Services, 8 Mint Walk, London.

# EXCEPTIONAL SALES OPPORTUNITIES TELEPROCESSING

## MIDDLESEX

EARNINGS £10-12K  
+ CAR + BENEFITS

Opportunities exist for dynamic computer sales executives to join one of the largest and best known groups of companies in the U.K. A major subsidiary of this £500M organisation has recently announced a revolutionary telecommunications and computer concept which they are actively marketing in the United Kingdom and Europe.

The product has already been outstandingly successful in the U.S.A. where it has been sold extensively, mainly to IBM main-frame users. Our Clients are heavily committed to investing in continued development and enhancement of the product and will be giving it extensive publicity and support.

The candidate profile will not be easy to meet, as we are looking for the true professional; self-motivating, ambitious, capable of complete autonomy to develop business interests and able to communicate perfectly at all levels of management. A pre-requisite is a proven successful track record in selling computer products over the last 3-5 years with a major manufacturer and a sound knowledge of IBM hardware and software would be a distinct advantage.

True, we are asking a great deal and are looking for the best, but the potential and rewards that our Clients offer are in turn exceptional. Candidates who feel they identify with our requirements are invited to contact the Advising Consultant to arrange an immediate meeting for further discussions. When replying please quote the relevant reference number CW/212/1.

HUTTON EXECUTIVE SELECTION LTD.  
HUTTON HOUSE  
HUTTON STREET, LONDON EC4Y 8HR  
01-353 6187 (Office Hours)  
01-353 1426 (Afternoon Service)

# Hutton

SPECIALIST RECRUITMENT CONSULTANTS



## North Sea Oil Exploration and Production PROGRAMMER

**Sunbury-on-Thames**  
Unionoil Company of Great Britain, a subsidiary of Union Oil Company of California, wishes to engage a Programmer for the Exploration Department at Sunbury-on-Thames. Reporting to the Chief Geophysicist, responsibilities include optimising and extending an existing geophysical/geological mapping and data reduction software package and supervising the digitisation and input of the related data.  
Candidates, male or female, should have an HNC/HND and one or two years' experience with writing software in the scientific/engineering field, but most importantly, an ambitious attitude and desire to enter a field where hard work and a keen sense of responsibility are rewarded. Experience with WANG 2200 equipment would be an advantage.  
This position offers a very competitive salary and benefits package and interesting career opportunities with an international oil exploration and production company.  
Interested individuals should respond in writing to the address below. All responses will be held in strict confidence.

Manager, Administrative Services,  
Unionoil Company of Great Britain,  
32 Cadbury Road,  
Sunbury-on-Thames, Middlesex.  
Telephone: Sunbury-On-Thames 85600.

**UNION**



**CRC INFORMATION SYSTEMS LTD**  
has a vacancy for a

## UNIVAC 1100 SYSTEMS PROGRAMMER

**THE COMPANY**  
CRC provides interactive computing services to a wide range of industrial and commercial users and is part of Général de Service Informatique (G.S.I.), G.S.I. is the largest European-owned service bureau. CRC has been selected to provide services to Infolina and additional staff are required to support this function together with CRC's Scan and Quotol information services on a large Univac 1100 configuration at Slough.

**THE JOB**  
The successful candidate will report to the 1100 systems manager and will support application programmers and users with special emphasis in database support. There will be involvement with EXEC 8 (OS 1100), OMS 1100, OLP, TIP, communications software and CTS (or HUS).

**THE CANDIDATE**  
Will have at least 1 year's 1100 assembler programming experience, 4 years' computing experience including Cobol (1 year) and applications experience. Knowledge of OMS 1100 (or similar Codeasy based software) and 1100 systems support would also be useful.

Candidates must be able to communicate easily to Slough or be prepared to relocate with assistance from the Company.

**TERMS**  
A highly competitive salary will be offered reflecting the ability to make a positive contribution in a progressive environment.

**APPLICATIONS**  
These should be addressed to E. J. WILLSON at 750 Oad Way, Slough Trading Estate, Slough, Barks and will be treated in strict confidence.

## CONTRACT PROGRAMMERS

### COBOL CROYDON AREA

We have several contracts to fill starting from 3rd January through to 30th January for good Cobol Programmers.  
We have a number of other requirements in London and the South East, requiring Cobol, PL/1, IMS and CICS experience.  
Telephone us now for details.

**FORCE 8**  
8 MINT WALK, CROYDON

**01-680 3761**

## ANSWARE

Importante Société de Services et de Conseil en Informatique recherche (plans de) cadres et d'un important projet de 6 mois

## PROGRAMMEURS

## et ANALYSTES-PROGRAMMEURS

- Formation Supérieure
- Expérience + 1 an
- pratiquant le COBOL
- connaissant bien le langage
- disponible immédiatement
- lieu de travail PARIS

Envoyez C.V., photo, date de disponibilité et prétentions de salaire à Monsieur HUOT  
136 rue de la Pompe  
75116 PARIS (FRANCE)  
Téléphone: (1) 504 28 60

## University of London Computer Centre

## Network Supervisor

The University of London Computer Centre is a regional computer centre which provides a computing service to London, South Eastern and South Western Universities on Control Data 7600, 8600, 8400 and Cyber 72 computers. The Centre supports a communications network of more than 30 remote batch terminals and 30 asynchronous lines.

Applications are invited for the post of Network Supervisor. The person appointed will supervise a small team engaged in diagnosing hardware problems, co-ordinating engineering support and generally making an effective contribution to the running of the Centre. Experience of similar work would be a definite advantage but an enthusiasm for engineering background would also be suitable.

Starting salary will depend on experience and will be on a scale up to £5027 (under review) + £450 London Allowance.

Leave entitlement is 6 weeks per annum.

Further details and application forms are available by phoning Linda Rowlands on 01-488 6408, ext. 248, or by writing to Operations Manager, UCC, 20 Oulford Street, London WC1.

## JUNIOR PROGRAMMER

National Daily Newspaper London

Required to assist in the operation of the software for specialised computer typesetting equipment engaged in printing a national daily newspaper.

The ideal candidate aged 17 to 20 years will have —

- A level in Maths or Science
- An understanding of computer science/logic
- Some training in an assembly language
- Some knowledge of printing.

But formal and informal training will be given in these areas to an otherwise suitable candidate.

Applications to: Ian Craig, 51 Clementine Place Limited, Broken House, Cannon Street, London EC4A 4BY.

## THE ALTERGO CHRISTMAS CRACKER

Altergo Business Systems Limited, probably the largest and fastest growing software consultancy, would like to give you a Christmas present.

If you are an Analyst or Programmer on System/3 or System/32 computers and have a good knowledge of RPGII aligned with a minimum of 4 years in DP, then we would like to discuss what Altergo can offer:

- Highly competitive salaries
- Bonus Scheme
- Overtime
- Expenses
- Overseas opportunities

If you can accept the challenge of working with the most dynamic software consultancy in the U.K. then contact:

Brian Walker/  
Barry Whitesman

**ALTERGO BUSINESS  
SYSTEMS LTD.**  
WARWICK HOUSE  
38 SOHO SQUARE  
LONDON W1V 5DF  
TELEPHONE:  
01-734 9681

**altergo**

## Advanced Systems



## MAJOR OPPORTUNITIES IN TRAINING AND SOFTWARE MARKETING

### Advanced Systems

We are an International Company with over 9 years' success in marketing a multi media library of courses based upon video, audio and text. Worldwide we have over 5,500 customers. Our courses cover a wide range of skills within Data Processing, Management and Production Control.

Major expansion in the UK and Europe demands additional staff:

**Software Sales £8000-£11000+**  
ASI has recently acquired the UK marketing rights to two highly successful American Project Control packages. A self-starter with ideally a combination of experience in software sales and project control is required to launch these products. Considerable scope for personal initiative and responsibility will be given. Training in the USA.

**Sales £8000-£11000+**  
Candidates, aged 27-35, will have experience and success in DP Sales with ideally a technical or training background in an IBM environment. Ability to negotiate at the highest level, personal discipline and motivation are essential. Training in the USA.

### Education Consultant

**C £7000**  
Candidates aged 25-35 will be graduates with experience in IBM installations and some background in installing and managing a training scheme. This support function will involve working directly with our customers in an advisory and consulting role, preparing detailed career development programmes, and installing the Project Control packages. Mobility in the UK essential.

These positions provide a rare opportunity to join a company which is the market leader in its field with over 500 clients in the UK and Europe and, as a result of its rapid growth rate, offers exciting career advancement opportunities worldwide.

TELEPHONE John Kirkham, General Manager, today on 01-584 8862 or write enclosing brief career details to:

**ADVANCED SYSTEMS INC.**  
1 Knightsbridge Green  
London SW5 7QA

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To assist management in the Midland Group of Factories to solve business problems we currently need to appoint several experienced Systems Analysts and Trainee Analysts, male or female.

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## THE SALES BIT A story of Christmas

OAVIO cleared his desk with the dedication of a postal sorter. Kompass and Bradstreet back on the shelf, diary in his top drawer, the draft of his latest proposal into the filing cabinet, gold-plated Parker into his inside pocket, the Daily Telegraph into the waste-paper basket and a wafer thin calculator into his black Samsonite, until only the two letters remained.

He was aware of the chatter and rock-and-roll of the in-house festivities drifting up from the floor below, heavy breathing to a climax of disco and tonic euphoria, but their siren call held no attraction for him. Instead, he stared out at a non-spangled London from the vantage of his 14th floor pigeon-hole and wondered how many of the 84 Christmas cards which he had sent to clients and prospects of varying potential were witnessing similar celebrations within their electric typewriter jungle.

The context of the rambling internal memo from his sales manager could have been expressed in a single sentence. "Well done David, now do twice as much next year."

He found himself torn between the ego boost and cyclicality that were implicit within the communication. So he was top salesman again. Sure he enjoyed the thrill of the chase and ultimate success — but what was he really achieving?

Further thought was abandoned as Pete came through the office door, almost forgetting to open it, as he conveyed a half pint glass of gin and tonic crowned with a forlorn piece of waterlogged lemon. David casually turned the papers face down on the desk.





## NEWS IN BRIEF

## Viewdata goes to Zurich

HIGHLIGHTING the export potential of the Post Office's Viewdata service, a conference on Viewdata is to be held next year in Zurich by Butler, Cox and Partners in collaboration with the Post Office.

The Zurich conference will be held on March 2 and a similar conference will be held in Birmingham on February 14.

The conferences will follow the format of a successful London conference held earlier this year, the transcript of which is now available for £80. Details of the conferences and the transcript can be obtained from Butler, Cox and Partners, The Press Centre, 78 Shoe Lane, London EC4 3JB.

## New factory

THE Scottish manufacturer of banking terminals and word processing equipment, Fortronic (Fife), has opened a second factory at Fife, adding 14,000 square feet to its production and development space.

## Compeda board

TO further strengthen its marketing and support subsidiary Compeda, the National Research Development Corp. has appointed its financial director, David Thomson, as chairman. Another NRDC officer, Thomas Fellow, is to serve as a part-time board member.

## French Bill

THE French privacy and protection Bill, which had its first reading two months ago (CW, October 13), has been heavily amended in the Senate, and returns to the National Assembly for a second reading this week.

## COMPUTER WEEKLY

## 1977—that was the year when the micro came into its own

1977 WAS the year in which the microprocessor emerged as a major catalyst in making the computer community, and society as a whole, more aware of the impact that information technology is likely to have on all aspects of society.

It was also the year of IBM price cuts and the switch of Geoffrey Cross from ICL managing director to GEC Stateide company hunter; a year of increased recognition for the computer services business and a major shortage of skilled computer staff.

These were some of the most commonly quoted events of the year according to an end-of-year survey by Computer Weekly which asked a number of industry experts, "What were the highlights of 1977?"

David Fimberg, director of the National Computing Centre, pointed to the need for studies at national level to analyse the impact of information technology.

"The year saw the emergence of real concern among an increasing number of people that the availability of aggressively sold, cheap and mass produced computer sto-



Fimberg



Barron

rage and processing devices had widespread implications, and that these implications, both good and bad, ought to be seriously studied at a national level," he said.

The Computer Weekly/ACM conference on "Can Computers save Britain?" (CW, July 14), held at Hedsor Park, was cited by the director of the government's Central Computer Agency, Reay Atkinson, as one of the most important events of the year which helped to crystallise attention on the impact of information technology.

He also felt that microcomputers were now having an impact not only on computer

people but also on end users.

One of the Hedsor speakers, consultant Iann Barron, coined the phrase "transputer" to signify the impact of the micro.

"The single-chip micro is primarily concerned with what is happening outside the processor whereas the traditional mainframe and minicomputer are primarily concerned with the computational activity within the computer."

For the services industry, 1977 was the year when that side of the business achieved recognition by both the public and private sectors, according to the director general of Computing Services Association, Alan Benjamin.

"This was the year it all happened for us," he said. "Our collaborative studies with the government crystallised this year and there were big organisations in both sectors giving major system development contracts to systems houses. And it's now becoming recognised that part of a computing professional's career should be spent in the services industry because of the standards and the levels of training."

Government recognition of the importance of a viable national software business with "a welcome intervention by the NEB through the formation of the Inspec computer services company," was emphasised by ASTMS national organiser, Tim Webb.

But, he added, "although trade union membership continued to grow among computer staff, it was not a good year for the industry as a whole, with government pay policy creating a major obstacle in recruiting qualified technical staff on to frozen salary scales."

For Neville Taylor, chairman of the Data Processing Management Association, 1977 would be remembered for the start of the mini/micro revolution coupled with an increasing emphasis on the user. Professor Paul Samet, BCS president, and director of the computing centre at University College, London, said that 1977 saw the beginning of a realisation that distributed processing systems will change the nature of computer departments and the way they will work.

## Low costs of labour attract investment in UK

THE low cost of labour, good management and software skills and use of the English language are factors which attract investment in the UK by foreign-owned computer companies. But the availability of a larger skilled labour force and better financial inducements in the rest of the EEC are powerful inducements for investment to be made in other European countries.

These were the main findings of a study of the investment criteria used by multinational companies upgrading in the UK. The study is being carried out by

the multinational sub-committee of the Neddly computer sector working party.

The survey was conducted among 15 multinational companies, although only nine completed a questionnaire prepared by the sub-committee. The other companies are discussing the factors covered by the questionnaire in meetings with the sub-committee.

Although the sub-committee's interim report says that it was "disappointed" at the overall response to the questionnaire, as it had followed discussions with the companies involved, it was satisfied with the co-operation received from the companies through a series of meetings which are still being held.

A DEC spokeswoman said

that the main reason the company had not completed the questionnaire was that it would have to reveal proprietary information, but that the company had subsequently had a "long and fruitful" meeting with Neddly representatives.

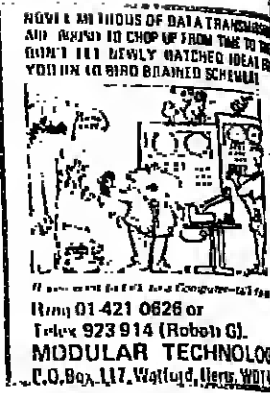
Other companies which did not fill in the questionnaire were IBM, Burroughs, CDC, Olivetti and Siemens. Companies completing the questionnaire were Data General, Interdata, NCR, Nixdorf, Univac, Hewlett Packard, Honeywell, Philips and Raytheon Coscor.

In its report, the sub-committee says that it expects the UK balance of payments deficit for computer trade to worsen in 1977 from last year's deficit of £110 million.

## Japan to cut tariffs?

A POSSIBILITY that Japan will cut tariffs on imported mainframes and peripherals has been reported in the US, but the Japanese Ministry of International Trade and Industry says no decision has been reached.

Japan is under considerable pressure from both the US and the EEC to cut tariffs on a broad front in order to give a stimulus to the world economy and cut back its enormous foreign trade surplus.



## DoE sets up CAD research programme

PROGRESS in computer architecture and building design is to be the subject of a research programme initiated by the Department of the Environment. As a first step, Systems Simulation Ltd. has been commissioned to develop a work plan for the project.

The DoE research aims to coordinate experience in computer aided design building and to improve understanding of its capabilities and current limitations.

The man-computer interface is seen as a particularly critical area for these systems, and the Department expects to gain experience from several projects including hospitals and general business systems.

The research will consider particular tools, techniques and may make recommendations on the Department's own system, Cedar 3, which is about to enter an evaluation phase.

Systems Simulation director, Alan Sutcliffe, feels that optimism about computer-aided building design was justified.

"There is a lot more to do than the enthusiasts thought. Now the time to take stock and where we must go," he said.

"There are many good computer systems available, but the big problem remains architectural resistance to their use."

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## 'Prepare for bloodbath'

By Keith Jones

LEASING companies that have assigned inflated residual values to their clients' IBM 370 machines should prepare now for a bloodbath. This warning was made at a leasing seminar in the US by Sonny Monosson, president of the Boston-based consultancy, the American Computer Appraisal Service.

One of the main causes of the disaster, according to Monosson, will be leasing companies' reliance on the insurance cover provided on residual

values by underwriters at Lloyd's of London — a problem highlighted last week (CW, December 8).

Monosson pointed out that the leasing of new large computers had been very easy with Lloyd's underwriters guaranteeing the revenues from them, but leasing companies had been blind to the fine print in the Lloyd's policies saying that they would have to exercise "due diligence" in their remarketing.



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*H.P.A.*

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